Agilent J7230A

OmniBER OTN
10 Gb/s communications
performance analyzer

Remote Control Manual

Agilent Technologies

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Agilent J723xx

In This Book

This manual contains all the information necessary for remote control of the Instrument.

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1

Methods of Remote Control

Introduction

The Instrument can be remotely controlled in one of four ways, each of which is configured via the Remote Control Setup dialog which is availeble from the main menu.

GPIB Provides a parallel interface that allows the connection of other devices to the system for example: Frequency Counter; Printer; Signal Generator. Allows great flexibility in communicating data and controlling data and provides one of the easiest methods of constructing automatic systems. If long distance communication is required, suitable GPIB Extenders must be connected within the test system at both ends of the communication link.

RS-232-C Provides a serial interface that can be connected directly to the RS-232-C port of a terminal or computer. Only the controller and the Instrument can be connected within the system. If long distance communication is required, the Instrument can be connected directly to the RS-232-C port of a Modem and controlled via a telephone line.

LAN Provides a parallel interface that allows the connection of other instruments and controllers to the system for example: workstations; other instruments; other test sets that have a LAN interface.

Connecting the Instrument via GPIB

The following points should be considered when connecting the Instrument via GPIB:

- Operating distances
- Communication with the system controller

Operating Distances

1. The total length of GPIB cable must not exceed 2 meters (6 feet) * the number of devices in the system.

2. The total length of GPIB cable, used to interconnect all devices in the system, must not exceed 20 meters (65 feet).

Operating distances can be increased by using GPIB Extenders.

Communication with the System Controller

Each device in the system must have a unique address to allow the controller to access each one individually. Any address in the range 0 to 30 can be selected.

Connecting the Instrument via RS-232-C

Remote control via RS-232-C requires that the Instrument RS-232-C interface settings match those of the controller.

The Instrument acts as a DTE (Data Terminal Equipment).

Table 1-1 Instrument RS-232-C port connections

Instrument Pin #	Signal	Input/Output
1	DCD	Input
2	RXD	Input
3	TXD	Output
4	DTR	Output
5	GND	GND
6	DSR	Input
7	RTS	Output
8	CTS	Input
9	N/A	N/A

Connecting the Instrument via LAN

Obtain the following information from your LAN System Administrator before connecting to the LAN:

- IP address (Example 156.144.180.205)
- Subnet Mask (Example 255.255.248.000).
- Default Gateway IP Address (Example 156.144.176.100).

The PORT NUMBER has a default value of 5001. A unique MAC ADDRESS is assigned to the Instrument at the time of shipment.

Now configure the Instrument to accept the IP address, Subnet Mask, Default Gateway IP Address and new Port Number as required.

Connect the Instrument LAN interface to the LAN network.

Command Prompt

Available for LAN and RS-232-C.

The Command Prompt mode allows the instrument to be controlled interactively and provides the following features:

When connection is established the Instrument responds with a prompt string.

Characters sent to the Instrument are echoed back to the terminal. If a command in wrongly entered then the Status Byte (STB) is flagged as follows:

STB: [EEQ]

This shows that the EEQ bit is set, indicating a message in the error/event queue. This can be retrieved using the command SYST:ERR?

Controlling the Instrument

The simplest way to verify the connection and become familiar with remote RS-232-C operation is to send a few commands and observe their effect. In this example using a terminal we will:

- Take the Instrument under remote control
- Initialize the Instrument
- Read the contents of the error register
- Start a test period
- Add errors
- Obtain the result (Option dependent)
- Return the Instrument to local operation

Table 1-2 Example sequence of SCPI commands

Terminal Input	Comment
:SYST:REM	Takes the Instrument under remote control. An indicator will light.
*RST	Default settings, registers cleared.
:SYST:ERR?	The SCPI Error Message and number can be read, even in local operation mode. (+0, "No error")
:SENS:DATA:TEL:TEST:TYPE MAN	Selects a manual test period.
:SENS:DATA:TEL:TEST ON	Starts the manual test period.
:SOUR:DATA:TEL:ERR:SING	Adds a single bit error.
:SOUR:DATA:TEL:ERR:SING	Adds a single bit error.
:SOUR:DATA:TEL:ERR:SING	Adds a single bit error.
:SENS:DATA:TEL:TEST OFF	Halts the manual test period.
:SENS:DATA? "ECO:BIT"	Returns the bit error count in numeric form, in this example 3.

Terminal Input	Comment
:SYST:LOC	Returns the Instrument to local control. The remote indicator is extinguished.

To Initialize the Instrument

Regardless of the current set up, the following command will initialize the Instrument. It sets the Instrument to the factory default settings and clears all registers. It will halt any applications currently running.

```
*RST
```

It is recommended that you do not rely on default settings but program each setting to what you require.

Remote Control Hints & Tips

This section gives some Hints & Tips on how to control the Instrument via remote control. Before writing any program to control the Instrument it may help to manually go through the steps required to set up the desired configuration. The order in which you should send the corresponding SCPI commands will usually follow the order in which you set up the Instrument from the Front Panel.

Default Settings

In general, default settings should not be assumed. It is recommended that each instrument setting should be explicitly programmed to the desired value.

Also commands that affect higher level settings such as Signal Rate or Payload Type should be sent before commands to set up lower level settings e.g. Pattern. This is because, in some cases, higher level setting changes can affect the values of lower settings.

Instrument Coupling

If you wish to set the Instrument Transmitter and Receiver to the same settings then you can save time by selecting Transmitter/Receiver Coupling. Depending upon the direction of coupling set (ie Tx to Rx or Rx to Tx), programming either the Receiver or the Transmitter will cause the coupled Transmitter or Receiver to be similarly programmed.

To turn coupling on use the command

```
:INSTrument:COUPle
```

Error Checking

It is recommended that, when sending SCPI commands to the Instrument, you also periodically send the SYSTem:ERRor? command to check for any Remote Control Errors reported by the instrument. This command returns

0, "No Error" if there are no errors in the error queue. If the SYSTem:ERRor? command is sent after every set up command then it makes debugging any reported errors much easier since you will know exactly which command caused the error.

The actual error queue within the Instrument can be cleared by sending the *CLS command.

Command Completion

When programming the instrument over RS-232-C, it is important to realize that a buffer exists in the Instrument between the RS-232-C port and the SCPI parser.

The effect of this is that even if the Instrument accepts the last character of a command, it cannot be assumed that it will immediately be executed - there could be several commands ahead of this one waiting in the buffer.

If you need to know when a command, or sequence of commands has been accepted by the instrument, follow them with a query command. When the response to the query command is returned, then you know that all commands prior to that have been executed.

Suitable query commands to use are *OPC? or SYSTem:ERRor? (which also gives the additional benefit of error checking as described above).

Note that this effect does not apply with GPIB. When GPIB is used to remotely control the Instrument then, after the last character of a SCPI command has been accepted by the instrument, its execution is imminent. However, it is still good practice to send SYSTem:ERRor? after each command in order to check for error free completion.

Set up Delays

Even after the Instrument has accepted a SCPI command it may take some time for it to execute the requested operation (e.g. payload change, single error add). It is therefore recommended that at least 250 ms is allowed after the command has completed before expecting the

instrument operation to occur. One way of determining if such delays exist is to perform the desired operation manually using the Instrument's Front Panel and checking if there is any noticeable delay in execution.

Status Registers

Status registers in general are only updated every 100 ms by the Instrument. Therefore you should avoid reading them any faster than that since, although it does not do any harm if they are read faster, it means that less processing power will be available to update the display.

If you need to detect a status register bit that is momentarily changing state, avoid using the condition register in the hope of catching both states. Instead it is much better to program the PTRansition and NTRansition registers to catch the event of interest, and then use the event register to monitor for the event.

For example, say you wished to detect when the K1 and K2 bytes in the Multiplex Section Line Overhead of a STM-1/STS-3 signal have changed. There is a K1K2 bit defined (DB6) in the SDH2/SONet2 Status Register that is set when these bytes change value.

However, if you monitored the SDH2/SONet2 status register simply by sending the STATus:SDH2:CONDition? or STATus:SON2:CONDition? command then it is very likely that you would miss any transition in the K1K2 bit.

A better method is as follows.

1. Set transition filter to pass positive transitions in K1K2 (DB6) — `:STATus:SDH2:PTR 64;NTR 0`
2. Periodically read SDH2 event register. — `:STATus:SDH2:EVENt?`
3. Periodically read SONet2 event register — `:STATus:SONet2:EVENt?`
4. Check for K1K2 (DB6) being set.

Using this technique you will detect any changes in the K1 and K2 bytes.

If you needed to monitor a number of status bits then using this method would not be ideal since it would have the disadvantage of having to regularly read a number of status registers. A general rule is to minimize the number of status register reads required and, to achieve this, use can be made of the Summary registers. For details on how to use the Summary registers and also the SRQ mechanism (GPIB only) see Programmed Status Reporting on page 7-1.

Test Period Control

There are a number of status register bits that can be used to indicate the state of the Instrument's measurement system.

When you send the start Test Period command to the Instrument you should check the MEAS bit (DB4) in the OPERation status register. This is because the Instrument takes a finite period of time to start the Test Period. When the MEAS bit is set to one it means that the Instrument is in the Test Period.

If it is required to retrieve Last second results while the Instrument is in the Test Period then the STP bit (DB6) in the INSTrument status register can be used to determine when last second results can be read i.e. when the first last second test period has completed.

The EOT bit (DB2) in the INSTrument status register can be used to determine when the Instrument Test Period period is complete.

2

Common SCPI Command Reference

SCPI Command Format, see page, 2-2

Remote Control Commands, see page, 2-5

INSTrument subsystem, see page, 2-6

OUTPut subsystem - Common Commands, see page, 2-7

SOURce subsystem, see page, 2-10

SOURce subsystem - Transmitter Common Commands, see page, 2-12

SOURce subsystem - Clock Function Commands, see page, 2-13

SOURce subsystem - Pattern Commands, see page, 2-15

SOURce subsystem - Test Functions, see page, 2-18

INPut subsystem - Common Commands, see page, 2-19

SENSe subsystem, see page, 2-22

SENSe subsystem - Pattern Commands, see page, 2-24

SENSe subsystem - Test Timing, see page, 2-30

SENSe subsystem - Result Returning Commands, see page, 2-32

STATus subsystem, see page, 2-34

SYSTem Subsystem, see page, 2-36

IEEE Common Capabilities, see page , see page, 2-49

Common Commands

This chapter contains general information on SCPI commands, and detailed information on the commands that are common for all types of instrument operation.

SCPI Command Format

Instrument functions such as making measurements, retrieving data, and querying status, are performed by stringing together SCPI "nodes" into commands. The SCPI commands are based on a hierarchical structure called a "subsystem" that comprises a top level "root" node and one or more lower-level nodes and their parameters as follows:

:INPut:TELecom:CODE <CMI> or <AMI> or <HDB3>

:INPut is the root node
:TELecom is a second level node
:CODE is a third level node
CMI, AMI and HDB3 are parameters of the third-level:CODE node.

Command Syntax

Commands are shown as a mix of upper and lowercase characters.

Commands can be abbreviated for shorter program line lengths. The uppercase characters define the abbreviated form of the command.

Commands are formed by linking the root node with lower-level nodes. A colon (:) is used to link nodes.
If the command requires a parameter, a space must separate the lowest level node and the parameter. If there is more than one parameter, a comma (,) is used to separate the parameters.

Examples of typical commands and their abbreviated form are shown below:

:INPut:TELecom:CODE AMI	full form
:INP:TEL:CODE AMI	abbreviated form
:SOURce:DATA:TELecom:PATTern PRBS23	full form
:SOUR:DATA:TEL:PATT PRBS23	abbreviated form

SCPI Long Form Command Headers

The general rule for SCPI long form command nodes that are greater than four characters in length is as follows:

Abbreviated short form mnemonics - the first four characters from the long form mode are used unless the fourth character is a vowel. In such cases, the vowel is dropped and only the first three characters are used.

If the node is four characters long then all four characters are used, irrespective of whether the fourth character is a vowel or not.

Linking Command Statements

Command statements can be linked using semicolons (;). For example:

```
:INPut:TELecom:CODE AMI;:SOURce:DATA:TELecom:PATTern
PRBS23
```

Parameters

In this manual, parameters are shown in angled brackets < >. There are five parameter types used in commands as listed in table 2-1.

Table 2-1 Parameter Types

Parameter Types	Description
<numeric>	All commonly used decimal numbers including optional signs, decimal points, and scientific notation. Examples are 123, 123E2, –123, –1.23E2, .123, .123E2 and1.2300E–01. Special cases include MINimum and MAXimum. A numeric parameter can also be specified in hex, octal, and/or binary. Examples are #H7B, #Q173 and #B11110111.
<boolean>	A single binary condition that is either true or false. Examples are ON, OFF, 1 and 0.

Parameter Types	Description
<discrete>	Values that are represented by a string of alphanumeric characters. Examples are INTernal and EXTernal.
<string>	Any set of ASCII characters enclosed within single quotes or double quotes. Examples are '111111111111111' and "0000000000000000".
<block>	Used to transfer large quantities of related data. Blocks can be sent as **definite length blocks** (#<numeric><numeric>) or **indefinite length blocks** (#0).

Occasionally, a command may use more than one parameter of the same type. When this occurs, the order of the parameters used in the command will map to the order of the individual parameter descriptions.

Remote Control Commands

The remote control commands in this manual have been grouped into Sections that relate to instrument functions. These have then been split into Subsystems

The Subsystems used in the Instrument are listed in table 2-2.

Table 2-2 SCPI Subsystems

Instrument Functions	Subsystem
To control SIGNAL OUT port	:OUTPut
To control instrument coupling.	:INSTrument
To control the transmitter data.	:SOURce
To control the SIGNAL IN port.	:INPut
To control the receiver results and graphics	:SENSe
To obtain results directly accumulated by the instrument.	:FETCh
To control the instrument misc. functions eg data setting.	:SYSTem
To control Status Reporting.	:STATus

INSTrument subsystem

The INSTrument subsystem is used to control the coupling between the transmitter and the receiver.

:INSTrument:COUPle <discrete>

<discrete> =	OFF	Independent
	TXRX	Coupled Tx to Rx
	RXTX	Coupled Rx to Tx

After a reset the receiver and transmitter coupling will be OFF. If the instrument is testing and the receiver and transmitter are coupled, changing certain transmitter settings will generate an error because the coupled receiver setting cannot be changed because of testing lock.

The corresponding query returns the coupling state in discrete form as listed above.

:INSTrument:COUPle?

Returns: <discrete>

OUTPut subsystem - Common Commands

The OUTPut subsytem contains commands that control the characteristics of the instrument's output ports.

:OUTPut:TELecom:INTerface <discrete>

<discrete> =	ELECtrical	Electrical Interface
	OPTical	Optical Interface

Selects the output port interface as either electrical or optical.

The corresponding query returns the port interface in discrete form as listed above.

:OUTPut:TELecom:INTerface?

Returns: <discrete>

:OUTPut:TELecom:TERMination <discrete>

<discrete> =	UNB75	75 ohm unbalanced line
	BAL100	100 ohm balanced line
	BAL120	120 ohm balanced line

Selects the electrical termination of the output port.

The corresponding query returns the electrical termination in discrete form as listed above.

:OUTPut:TELecom:TERMination?

Returns: <discrete>

:OUTPut:TELecom:LEVel <discrete>

<discrete> =	DSX	
	HIGH	DS3 only

	FT900	
	LOW	DS1 only

Selects the interface output level for the output port.

The corresponding query returns the output level in discrete form as listed above.

:OUTPut:TELecom:LEVel?

Returns: <discrete>

:OUTPut:TELecom:CODE <discrete>

<discrete> =	NRZ	optical only
	CMI	140Mb/s only
	B3ZS	DS3
	HDB3	34Mb/s,8Mb/s,2Mb/s
	B8ZS	DS1
	AMI	DS1

Selects the interface line cowde for the output port.

The corresponding query returns the line code in discrete form as listed above.

:OUTPut:TELecom:CODE?

Returns: <discrete>

:OUTPut:TELecom:WAVelength <discrete>

<discrete> =	NM1310	1310nm wavelength
	NM1550	1550nm wavelength

Selects the optical wave;length of the output port.

The corresponding query returns the wavelength of the optical ouput port in discrete form as listed above.

:OUTPut:TELecom:WAVelength?

Returns: <discrete>

:OUTPut:TELecom:LASer <boolean>

<boolean> =	OFF	Select Laser Off
	ON	Select Laser On

Controls the state of the laser (ON or OFF) on the Optical module.

The corresponding query returns the state of the laser in discrete form as listed above.

:OUTPut:TELecom:LASer?

Returns: <boolean>

SOURce subsystem

The SOURce subsystem contains commands that allow the transmitter settings to be set. The commands within the SOURce subsystem have been arranged as follows:

Chapter 2	SOURce subsystem - Transmitter Common Commands	**COMMON**
Chapter 3	SOURce subsystem - Transmitter OTN Settings Commands	**OTN**
	SOURce subsystem - Transmitter OTN Overhead Setup Commands	**OTN**
	SOURce subsystem - Transmitter Error Test Function	**OTN**
	SOURce subsystem - Transmitter Alarm Test Functions	**OTN**
	SOURce subsystem - Transmitter Frequency Offset Commands	**OTN**
Chapter 4	SOURce subsystem - Transmitter SDH Settings Commands	**SDH**
	SOURce subsystem - Transmitter SDH Overhead Set Up	**SDH**
	SOURce subsystem - Transmitter Error Test Functions	**SDH**
	SOURce subsystem - Transmitter Alarm Test Functions	**SDH**
	SOURce subsystem - Pointer Adjust Test Functions	**SDH**
	SOURce subsystem - Frequency Offset Test Functions	**SDH**
Chapter 5	SOURce subsystem - Transmitter SONET Settings Commands	**SONET**
	SOURce subsystem - Transmitter SONET Overhead Set Up	**SONET**
	SOURce subsystem – SONET Error Test Functions	**SONET**
	SOURce subsystem – Transmitter Alarm Test	**SONET**

	Functions	
	SOURce subsystem - Pointer Adjust Test Functions	**SONET**
	SOURce subsystem - Frequency Offset Test Functions	**SONET**
Chapter 6	SOURce subsystem - Transmitter UNFRamed Settings Commands	**UNFRAMED**
	SOURce subsystem - Transmitter Error Test Function Commands	**UNFRAMED**
	SOURce subsystem - Frequency Offset Test Function	**UNFRAMED**

Where commands are applicable to more than one category these are included in all the applicable categories.

SOURce subsystem - Transmitter Common Commands

:SOURce:DATA:TELecom:MODE <discrete>

<discrete> =	OTN	OTN Mode
	SDH	SDH Mode
	SONet	SONET Mode
	UNFRamed	Unframed Mode

Selects the transmitter mode.

The corresponding query returns the transmitter mode in discrete form listed above.

:SOURce:DATA:TELecom:MODE?

Returns: <discrete>

:SOURce:DATA:TELecom:THRU <boolean>

<boolean> =	OFF	Select Normal Mode
	ON	Select Thru Mode

Selects/Deselects THRU mode.

The corresponding query returns the THRU mode state as a boolean value 0 or 1.

:SOURce:DATA:TELecom:THRU?

Returns: <boolean>

SOURce subsystem - Clock Function Commands

:SOURce:CLOCk:SOURce <discrete>

<discrete> =	INTernal	Internal
	EXTernal	External
	RECovered	Recovered

Selects the Clock Source for the transmitter.

The corresponding query returns the transmitter clock source in discrete form as listed above.

:SOURce:CLOCk:SOURce?

Returns: <discrete>

:SOURce:CLOCk:RECovered <discrete>

<discrete> =	RSTM0 | RSTS1	52Mb/s Electrical Rx
	ROPT0 | ROC1	52Mb/s Optical Rx
	RSTM1 | RSTS3	155Mb/s Electrical Rx
	ROPT1 | ROC3	155Mb/s Optical Rx
	ROPT4 | ROC12	622Mb/s Optical Rx
	ROPT16 | ROC48	2.4Gb/s Optical Rx
	ROPT64 | ROC192	9.6Gb/s Optical Rx
	ROTU2	10.71Gb/s Optical Rx
	R140M	140Mb/s
	R34M	34Mb/s
	R8M	8Mb/s
	R2M	2Mb/s
	RDS3	DS3
	RDS1	DS1

The corresponding query returns the recovered clock source in discrete form as listed above.

:SOURce:CLOCk:RECovered?

Returns: <discrete>

:SOURce:CLOCk:FORMat <discrete>

<discrete> =	M2CLock	Clock Format
	M2Data	Data Format
	DS1Data	DS1 bit rate

Selects the transmitter External clock sync source format.

The corresponding query returns the External clock sync source format in discrete form as listed above.

:SOURce:CLOCk:FORMat?

Returns: <discrete>

SOURce subsystem - Pattern Commands

:SOURce:DATA:TELecom:PATTern:TYPE <discrete>

<discrete> =	PRBS	Select PRBS Pattern
	WORD	Select Word Pattern

Selects the transmitter payload Pattern Type, pseudo random sequence or a word type pattern.

The corresponding query returns the Pattern Type in discrete form as listed above.

:SOURce:DATA:TELecom:PATTern:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:PATTern:TYPE:PRBS <discrete>

<discrete> =	PRBS9	$2^{9} - 1$
	PRBS11	$2^{11} - 1$
	PRBS15	$2^{15} - 1$
	PRBS20	$2^{20} - 1$
	PRBS23	$2^{23} - 1$
	PRBS31	$2^{31} - 1$
	QRSS	$2^{20} - 1$ with 14 consecutive zero limit

Selects the Transmitter Payload Pattern. Used if :SOURce:DATA:TELecom:PATTern:TYPE <discrete> is set to PRBS

The corresponding query returns the PRBS pattern in discrete form as listed above.

:SOURce:DATA:TELecom:PATTern:TYPE:PRBS?

Returns: <discrete>

:SOURce:DATA:TELecom:PATTern:POLarity <discrete>

<discrete> =	NINVerted	Pattern Non-Inverted
	INVerted	Pattern Inverted

Sets the polarity of the PRBS pattern of the transmitter.

The corresponding query returns the polarity in discrete form as listed above.

:SOURce:DATA:TELecom:PATTern:POLarity?

Returns: <discrete>

:SOURce:DATA:TELecom:PATTern:TYPE:WORD <discrete>

<discrete> =	PRESet	Selects a preset word
	USER	Selects user word

Selects the transmitter Payload Word Pattern type as either a preset word or a user generated word. This command is used if :SOURce:DATA:TELecom:PATTern:TYPE <discrete> is set to WORD.

The corresponding query returns the Transmitter Payload Word type in discrete form as listed above.

:SOURce:DATA:TELecom:PATTern:TYPE:WORD?

Returns: <discrete>

:SOURce:DATA:TELecom:PATTern:TYPE:WORD:PRESet <discrete>

<discrete> =	ALL0	All zeros
	ALL1	All ones
	B1010	Word 1010
	B1000	Word 1000
	STRess	3-in-24 stress pattern
	B1IN8	1-in-8 test pattern

B2IN8	2-in-8 test pattern
OCT55	55 octet test pattern (uses Daly pattern as per ANSI TI.403

Selects the transmitter payload preset Word Pattern.

This command is used when :SOURce:DATA:TELecom:PATTern:TYPE:WORD <discrete> is set to PRESet.

The corresponding query returns the PRBS payload Preset Word pattern in discrete form as listed above.

:SOURce:DATA:TELecom:PATTern:TYPE:WORD:PRESet?

Returns: <discrete>

:SOURce:DATA:TELecom:PATTern:TYPE:WORD:USER <numeric>

<numeric> = 0 to 65535 Payload user word

Sets the Transmitter Payload User Word Pattern, Hex and binary patterns can be entered using the #h and #b forms, width of word is 16 bits.

This command is used when :SOURce:DATA:TELecom:PATTern:TYPE:WORD <discrete> is set to USER.

The corresponding query returns the Transmitter Payload User Word as an integer.

:SOURce:DATA:TELecom:PATTern:TYPE:WORD:USER?

Returns: <numeric>

SOURce subsystem - Test Functions

:SOURce:DATA:TELecom:TFUNction:DISable

Disables ALL test functions running.

There is no corresponding query.

:SOURce:DATA:TELecom:ERRor:SINGle

Injects a single error.

There is no corresponding query.

INPut subsystem - Common Commands

:INPut:TELecom:CODE <discrete>

<discrete> =	NRZ	
	CMI	140Mb/s only
	B3ZS	DS3
	HDB3	34Mb/s,8Mb/s,2Mb/s
	B8ZS	DS1
	AMI	8Mb/s,2Mb/s,DS1

Selects the line code interface for the receiver.

The corresponding query returns the line code in discrete form as listed above.

:INPut:TELecom:CODE?

Returns: <discrete>

:INPut:TELecom:INTerface <discrete>

<discrete> =	ELECtrical	Electrical Interface
	OPTical	Optical Interface

Selects the port interface as either Electrical or Optical

The corresponding query returns the termination level in discrete form as listed above.

:INPut:TELecom:INTerface?

Returns: <discrete>

:INPut:TELecom:TERMination <discrete>

<discrete> =	UNB75	75 Ohm unbalanced
	BAL100	100 Ohm balanced
	BAL120	120 Ohm balanced

Selects the electrical termination of the input port.

The corresponding query returns the electrical termination type in discrete form as listed above.

:INPut:TELecom:TERMination?

Returns: <discrete>

:INPut:TELecom:LEVel <discrete>

<discrete> =	TERMinate	mode is Termination
	MONitor	mode is Monitor

Sets the Receiver Port as a Termination or a Monitor. The corresponding query returns the Input LEVel in discrete form as listed above

:INPut:TELecom:LEVel?

Returns: <discrete>

:INPut:TELecom:GAIN <discrete>

<discrete> =	DB20	All rates
	DB26	All rates
	DB30	DS1,2Mb/s,8Mb/s

Selects the Monitor Gain for the Receiver. Only valid when:INPut:TELecom:MODE is set to MONitor. The corresponding query returns the monitor gain in discrete for, as listed above.

:INPut:TELecom:GAIN?

Returns: <discrete>

:INPut:TELecom:EQUalization <boolean>

<boolean> = OFF
ON

Selects the Monitor equalization for the receiver. Only valid when:INPut:TELecom:MODE is set to MONitor.

The corresponding query returns the Monitor equalization state in boolean form.

:INPut:TELecom:EQUalization?

Returns: <boolean>

SENSe subsystem

The SENSe subsystem contains the commands that control the Receiver. These have been arranged in the following manner:

Chapter 2	SENSe subsystem - Pattern Commands	**COMM**
		COMM
	SENSe subsystem - Test Timing	
	SENSe subsystem - Result Returning Commands	**COMM**
Chapter 3	SENSe subsystem - Receiver OTN Settings Commands	**OTN**
	SENSe subsystem - Receiver Overhead Monitor Commands	**OTN**
	SENSe subsystem - Result Returning Commands	**OTN**
Chapter 4	SENSe subsystem - Receiver SDH Settings	**SDH**
	SENSe subsystem - Receiver SDH Test Function Commands	**SDH**
	SENSe subsystem – Result Returning Commands	**SDH**
Chapter 5	SENSe subsystem - Receiver SONET Settings	**SONET**
	SENSe subsystem - Receiver SONET Test Function Commands	**SONET**
	SENSe subsystem - Result Returning Commands	**SONET**
Chapter 6	SENSe subsystem - Receiver UNFRamed Settings Commands	**UNFRAMED**

SENSe subsystem - Receiver Common Commands

:SENSe:DATA:TELecom:MODE <discrete>

<discrete> =	OTN	OTN Mode
	SDH	SDH Mode
	SONet	SONET Mode
	UNFRamed	Unframed Mode

Selects the receiver mode.

The corresponding query returns the receiver mode in discrete form listed above.

:SENSe:DATA:TELecom:MODE?

Returns: <discrete>

SENSe subsystem - Pattern Commands

:SENSe:DATA:TELecom:PATTern:TYPE <discrete>

<discrete> =	PRBS	Pseudo-Random Bin. Pattern
	WORD	Word Pattern
	LIVE	Live Traffic

Selects the receiver payload pattern type.

The corresponding query returns the receiver payload data pattern type in discrete form as listed above

:SENSe:DATA:TELecom:PATTern:TYPE?

Returns: <discrete>

:SENSe:DATA:TELecom:PATTern:TYPE:PRBS <discrete>

<discrete> =	PRBS9	$2^9 - 1$
	PRBS11	$2^{11} - 1$
	PRBS15	$2^{15} - 1$
	PRBS20	$2^{20} - 1$
	PRBS23	$2^{23} - 1$
	PRBS31	$2^{31} - 1$
	QRSS	$2^{20} - 1$ with 14 consecutive zero limit

Selects the receiver payload pattern when :SENSe:DATA:TELecom:PATTern:TYPE <discrete> is set to PRBS.

The corresponding query returns the PRBS Pattern in discrete form, as listed above

:SENSe:DATA:TELecom:PATTern:TYPE:PRBS?

Returns: <discrete>

:SENSe:DATA:TELecom:PATTern:TYPE:WORD <discrete>

<discrete> =	PRESet	Selects a preset word
	USER	Selects user word

Selects the receiver Payload Word Pattern type as either a preset word or a user generated word. This command is used if is set to WORD.

The corresponding query returns the Receiver Payload Word type in discrete form as listed above.

:SENSe:DATA:TELecom:PATTern:TYPE:WORD?

Returns: <discrete>

:SENSe:DATA:TELecom:PATTern:TYPE:WORD:PRESet <discrete>

<discrete> =	ALL0	All zeros
	ALL1	All ones
	B1010	Word 1010
	B1000	Word 1000
	STRess	3-in-24 stress pattern
	B1IN8	1-in-8 pattern
	B2IN8	2-in-8 pattern
	OCT55	55 octet test pattern (uses Daly pattern as per ANSI TI.403)

Selects the receiver payload preset Word Pattern.

This command is used when :SENSe:DATA:TELecom:PATTern:TYPE:WORD <discrete> is set to PRESet.

The corresponding query returns the PRBS payload Preset Word pattern in discrete form as listed above.

:SENSe:DATA:TELecom:PATTern:TYPE:WORD:PRESet?

Returns: <discrete>

:SENSe:DATA:TELecom:PATTern:TYPE:WORD:USER <numeric>

<numeric> =	0 to 65535	User Word Pattern

Sets the Receiver Payload User Word Pattern in the range 0 to 65535. The prefix of #b or #h can be used to specify binary or hex respectively, width of the user word is 16 bits.

This command is used when :SENSe:DATA:TELecom:PATTern:TYPE:WORD <discrete> is set to USER.

The corresponding query returns the Receiver Payload User Word as an integer value.

:SENSe:DATA:TELecom:PATTern:TYPE:WORD:USER?

Returns: <numeric>

:SENSe:DATA:TELecom:PATTern:POLarity <discrete>

<discrete> =	NINVerted	Pattern Non-Inverted
	INVerted	Pattern Inverted

Sets the polarity of the PRBS pattern of the receiver.

The corresponding query returns the polarity in discrete form as listed above.

:SENSe:DATA:TELecom:PATTern:POLarity?

Returns: <discrete>

SENSe Subsystem - Data Capture Common Commands

The following commands are used for configuring Data Capture for OTN, SDH and SONET. When a trigger selection other than Manual is set, the specific trigger is set using commands specified in the appropriate chapter.

:SENSe:DATA:TELecom:DCAPture:DATA <discrete>

<discrete> =	OTN	Capture OTN Data
	SECTion	Capture SDH SOH Data
	TRANsport	Capture SONET TOH Data
	PATH	Capture SDH/SONET POH Data

Selects the data to be captured. To capture SDH/SONET, the receiver must be configured to receive the appropriate payload.

The corresponding query returns the selected data to be captured.

:SENSe:DATA:TELecom:DCAPture:DATA?

Returns: <discrete>

SENSe:DATA:TELecom:DCAPture:TRIGger:SELect <discrete>

<discrete> =	MANual	Manual trigger
	PRE	Pre-trigger capture
	CENTered	Centre-trigger capture
	POST	Post-trigger capture

Selects the type of trigger for Data Capture.

The corresponding query returns the selected data capture trigger selection in discrete form as listed above.

:SENSe:DATA:TELecom:DCAPture:TRIGger:SELect?

Returns: <discrete>

SENSe:DATA:TELecom:DCAPture:TRIGger:TYPE <discrete>

<discrete> =	ERRor	Error Triggers
	ALARm	Alarm Triggers

Selects the trigger type for Data Capture as either error triggers or alarm triggers.

The corresponding query returns the selected data capture trigger type in discrete form as listed above.

:SENSe:DATA:TELecom:DCAPture:TRIGger:TYPE?

Returns: <discrete>

SENSe:DATA:TELecom:DCAPture <discrete>

<discrete> =	STOP	Stops data capture
	STARt	Starts data capture

Stops and starts the Data Capture test function.

The corresponding query returns the capture status in discrete form listed above.

:SENSe:DATA:TELecom:DCAPture?

Returns: <discrete>

FETCh Subsystem - Data Capture Results Commands

The following commands return results relating to Data Capture and are common to OTN, SDH and SONET.

:FETCh:SCALar:DATA:TELecom:DCAPture:MINFrame?

Returns: <numeric>

Returns the minimum frame index of the captured data.

:FETCh:SCALar:DATA:TELecom:DCAPture:MAXFrame?

Returns: <numeric>

Returns the maximum frame index of the captured data.

:FETCh:STRing:DATA:TELecom:DCAPture:TIME?

Returns: <string>

Returns the timestamp of when data capture was triggered in string format. The timestamp has the format "HH:MM:SS". If data capture has not been triggered, the timestamp will be returned as "--:--:--".

SENSe subsystem - Test Timing

:SENSe:DATA:TELecom:TEST <boolean>

<boolean> =	0 or OFF	Stop the current test period
	1 or ON	Start a new test period

Start/Stop the test

The corresponding query returns the test state as 0 or 1.

:SENSe:DATA:TELecom:TEST?

Returns: <boolean>

:SENSe:DATA:TELecom:TEST:TYPE <discrete>

<discrete> =	MANual	Manual Test period
	SINGle	Single Test period
	TIMed	Timed Test period

Selects the type of test period. If SING is selected, the duration is set using :SENSe:DATA:TELecom:TEST:PERiod If TIMed is selected the duration is set using :SENSe:DATA:TELecom:TEST:PERiod and the start time with :SENSe:DATA:TELecom:TEST:STARt.

The corresponding query returns the test type in discrete form, as listed above.

:SENSe:DATA:TELecom:TEST:TYPE?

Returns: <discrete>

:SENSe:DATA:TELecom:TEST:PERiod <numeric>, <numeric>, <numeric>, <numeric>

<numeric> =	1 to 99	Days
<numeric> =	0 to 23	Hours
<numeric> =	0 to 59	Minutes
<numeric> =	0 to 59	Seconds

Sets the duration of the test period. Is only valid when :SENSe:DATA:TELecom:TEST:TYPE is set to SINGle.

The corresponding query returns the test duration as described above.

:SENSe:DATA:TELecom:TEST:PERiod?

Returns: <numeric>, <numeric>, <numeric>, <numeric>

:SENSe:DATA:TELecom:TEST:STARt <numeric>, <numeric>, <numeric>, <numeric>, <numeric>

< numeric> =		Year
< numeric> =	1 to 12	Month
< numeric> =	0 to 31	Day
< numeric> =	0 to 23	Hour
< numeric> =	0 to 59	Min

Sets the start of the test period. Is only valid when :SENSe:DATA:TELecom:TEST:TYPE is set to TIMed.

The corresponding query returns the test duration as described above.

:SENSe:DATA:TELecom:TEST:STARt?

Returns: <numeric>, <numeric>, <numeric>, <numeric>, <numeric>

SENSe subsystem - Result Returning Commands

Common Results

:SENSe:DATA? <string>

<string> =

"ETIMe"	Returns elapsed time
"ASEConds:LOS"	Loss of Signal
"ASEConds:CSL"	Clock Synch Loss
"ASEConds:PLOSs"	Power Loss
"ASEConds:PSL"	Pattern Sync Loss

Total Results

:SENSe:DATA? <string>

<string> =

"ECOunt:BIT"	Bit Error Count
"ERATio:BIT"	Bit Error Ratio
"ECOunt:CODE"	Code Error Count
"ERATio:CODE"	Code Error Ratio

Last Second Results

:SENSe:DATA? <string>

<string> =

"ECOunt:LSECond:BIT"	Bit Error Count for Last Second

Frequency Results

:SENSe:DATA? <string>

<string> =

"FREQuency"	Receiver clock frequency in Hz
"FOFPpm"	Receiver clock offset in ppm
"FOF"	Receiver offset frequency in Hz.

Service Disruption Results

:SENSe:DATA? <string>

<string> =

"SDTest:COUNt:LONG"	Longest service disruption duration in ms
"SDTest:COUNt:SHORt"	Shortest service disruption duration in ms
"SDTest:COUNt:LAST"	Most recent service disruption duration in ms

Returns: <range>,<value>

<range> =	0	Result is invalid due to receiver configuration
	1	Result valid
	2	Result out of range

Value is returned in milliseconds. If the value is > 2000 or no result is available or the result is not applicable then 9.91E+37 is returned.

STATus subsystem

This subsystem controls the status reporting registers. SCPI defined status registers QUEStionable, OPERation and INSTrument are provided. For detailed information on status reporting refer to Section 7 of this manual.

For each of the **<Status Registers>**'s listed in Table 7-1 Status Registers on page 7-2 (excluding the Standard Event Register) the following commands exist:

:STATus:<Status Register>:ENABle <numeric>

Sets the Event Enable register mask which allows true conditions in the Event register to be reported in the **<Status Register>**'s summary bit. If a bit is 1 in the Event Enable register and its associated event bit makes the transition to true, a positive transition will occur in the **<Status Register>**'s summary bit.

The corresponding query returns the current mask setting.

:STATus:<Status Register>:ENABle?

Returns: <numeric>

:STATus:<Status Register>:PTRansition <numeric>

Sets the positive Transition Filter. Setting a bit in the positive Transition filter shall cause a 0 to 1 transition in the corresponding bit of the **<Status Register>**'s Condition register to cause a 1 to be written in the corresponding bit of the **<Status Register>**'s Event register.

The corresponding query returns the current setting.

:STATus:<Status Register>:PTRansition?

Returns: <numeric>

:STATus:<Status Register>:NTRansition <numeric>

Sets the negative Transition filter. Setting a bit in the negative Transition Filter shall cause a 1 to 0 transition in the corresponding bit of the **<Status Register>**'s Condition register to cause a 1 to be written in the corresponding bit of the **<Status Register>**'s Event register.

The corresponding query returns the current setting.

:STATus:<Status Register>:NTRansition?

Returns: <numeric>

:STATus:<Status Register>:EVENt?

Returns: <numeric>

Returns the contents of the Event register associated with the **<Status Register>**. Reading this register clears its contents.

:STATus:<Status Register>:CONDition?

Returns: <numeric>

Returns the contents of the Condition register associated with the **<Status Register>**. Reading this register does not clear its contents.

SYSTem Subsystem

:SYSTem:DATE <year>,<month>,<day>

<year> =	<numeric>	2000 to 2035
<month> =	<numeric>	1 to 12
<day> =	<numeric>	1 to 31

Sets the date.

The corresponding query returns the date in numeric form.

:SYSTem:DATE?

Returns: <year>,<month>,<day>

:SYSTem:TIME <hour>,<minute>,<second>

<hour> =	<numeric>	0 to 23
<minute> =	<numeric>	0 to 59
<second> =	<numeric>	0 to 59

Sets the time.

The corresponding query returns the time in numeric form.

:SYSTem:TIME?

Returns: <hour>,<minute>,<second>

:SYSTem:LOCal

Set the Instrument to Local (keyboard) control. This command should only be used with LAN and RS232 connections. GPIB host controllers have different

methods for performing this action (for example, the LOCAL command in HP-BASIC).

:SYSTem:REMote

Set the Instrument to Remote control. This command is required only from LAN and RS232 connections. GPIB host controllers have different methods for performing this action (for example, the REMOTE command in HP-BASIC).

:SYSTem:PRESet

This command resets the instrument state. It performs the same task as *RST.

:SYSTem:SERial?

Returns: <string>

The serial number is returned as a string in the form "GBnnnnnnnn". GB signifies the country of origin (Great Britain).

:SYSTem:CONF <block>

<block> = #0 type Block

Sets the Instrumentto the state defined by the Block data.

The corresponding query returns the instrument state in block form.

:SYSTem:CONF?

Returns: #0<block>

:SYSTem:VERSion?

Returns: <string> = YYYY.V

Returns the revision state of the SCPI remote control.

The revision state is returned in the form YYYY.V. YYYY signifies the year and V signifies the revision number.

:SYSTem:ERRor?

Returns: <numeric>,<string>

Requests the Instrument remote control Error status.

The error status is returned as a numeric value and a string containing a description of the error.

Remote Settings

:SYSTem:REMCtrl:MODE <mode>

<mode> = <discrete> TERMinal or COMPuter

This setting changes the 'Command prompt' setting. If set to TERM then the command prompt setting is turned on. If set to COMP then command prompt setting is turned off.

:SYSTem:REMCtrl:MODE?

Returns: <discrete>

Returns the current 'Command prompt' setting. If it is disabled, returns COMP (computer). If it is enabled, returns TERM (terminal).

:SYSTem:REMCtrl:CONNector <connector>

<connector> = <discrete> GPIB, LAN or RS232

Sets which connector is used for remote control.

:SYSTem:REMCtrl:CONNector?

Returns: <discrete>

Returns the current remote control connector, GPIB, LAN or RS232.

:SYSTem:GPIB:ADDRess <address>

<address> = <numeric> GPIB address

Changes the address that the instrument uses on GPIB. The instrument will respond to the host controller when it is addressed using the new address number.

:SYSTem:GPIB:ADDRess?

Returns: <discrete>

Returns the instrument's current address number on GPIB.

:SYSTem:RS232:BAUDrate <baud>

<baud> = <numeric> Desired baud rate

Changes the baud rate used for RS232 communications. Note that only the following baud rates are valid: 110, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400. Attempt to set any other baud rate will cause an 'argument out of range' error.

:SYSTem:RS232:BAUDrate?

Returns: <numeric>

Returns the current RS232 baud rate setting.

:SYSTem:RS232:DATabits <bits>

<bits> = <numeric> 7 or 8

Sets the data size to 7 or 8 bytes. Attempt to set it to any other value will cause an 'argument out of range' error.

Note that remote control commands/queries that take/respond with block data may not work as expected if the data size is set to 7 bits. This is because block data uses 8-bit data.

:SYSTem:RS232:DATabits?

Returns: <numeric>

Returns the current data size.

:SYSTem:RS232:STOPbits <bits>

<bits> = <numeric> 1 or 2

Sets the number of stop bits.

:SYSTem:RS232:STOPbits?

Returns: <numeric>

Returns the current stop bits setting.

:SYSTem:RS232:PARity <parity>

<parity> = <discreet> NONE, EVEN or ODD

Sets the RS232 parity method to NONE, EVEN or ODD.

:SYSTem:RS232:PARity?

Returns: <discrete>

Returns the current RS232 parity setting.

:SYSTem:RS232:HANDshaking <method>

<method> = Discreet NONE, RTSCts or XONXoff

Sets the handshaking method. NONE indicates that no handshaking will be used. RTSCts uses the RS232 lines RTS and CTS to perform handshaking ('hardware handshaking'); this requires a correctly-wired 7-wire RS232 cable. XONXoff uses Xon/Xoff characters to perform handshaking ('software handshaking').

:SYSTem:RS232:HANDshaking?

Returns: <discrete>

Returns the current RS232 handshaking method - NONE, RTSC (for RTS/CTS) or XONX (for Xon/Xoff).

:SYSTem:NETWork:IP <address>

<address> = <string> New IP addresses

This changes the instrument's IP address. The address must be specified in standard 'dotted-quad' notation - for example, "10.225.0.226". If this is set to "0.0.0.0" then the IP address is cleared and the instrument will not attempt to connect to the network.

:SYSTem:NETWork:IP?

Returns: <string>

Returns the instrument's IP address in dotted quad notation - for example, "10.225.0.226"

:SYSTem:NETWork:MASK <mask>

<mask> = <string> New netmask

Sets the IP netmask. This must be specified in dotted-quad notation - for example, "255.255.248.0"

:SYSTem:NETWork:MASK?

Returns: <string>

Returns the IP netmask. This is specified in dotted-quad notation - for example, "255.255.248.0"

:SYSTem:NETWork:GATeway <address>

<address> = <string>

Sets the IP address of your network's default gateway. This address must be specified in dotted-quad notation – for example, "10.225.0.1". If your network does not have a default gateway, set this to "0.0.0.0".

:SYSTem:NETWork:GATeway?

Returns: <discrete>

Returns the IP address of the default gateway in dotted-quad notation - for example, "10.225.0.1".

Logging Commands

:SYSTem:LOGGing:AUTO <boolean>

<boolean> =	OFF	Select Auto Logging Off
	ON	Select Auto Logging On

The corresponding query returns the boolean state of the Auto Logging.

:SYSTem:LOGGing:AUTO?

Returns: <boolean>

:SYSTem:LOGGing:INTerval <discrete>

<discrete> =	OFF
	MIN15
	MIN30
	MIN60
	USER

The corresponding query returns the Logging Interval in discrete form as detailed above.

:SYSTem:LOGGing:INTerval?

Returns: <discrete>

:SYSTem:LOGGing:DESTination <discrete>

<discrete> =	DEBug
	FILE
	FLOPpy
	PRINter

Selects the logging destination for results logging

The corresponding query returns the logging destination in discrete form as listed above.

:SYSTem:LOGGing:DESTination?

Returns: <discrete>

:SYSTem:LOGGing:RESults <discrete>

<discrete> = DEBug
FILE
FLOPpy
PRINter

The corresponding query returns the Logging Destination in discrete form as detailed above.

:SYSTem:LOGGing:RESults?

Returns: <discrete>

SYSTem Subsystem - Trigger Output Common Commands

Transmitter Trigger Output Commands

:SYSTem:TRIGger:TRANsmit <discrete>

<discrete> =	NONE	No Trigger
	FRAMe	Start of Frame
	ERRor	Specified by Error Add
	ALARm	Specified by Alarm Add

Specifies when to generate a transmitter trigger output.

When FRAMe is selected, a further selection of network standard should be selected by :SYSTem:TRIGger:TRANsmit:FRAMe.

When ERRor or ALARm are specified, a trigger output is generated when an error or alarm is added using the appropriate test function.

The corresponding query returns the selected Trigger Output in discrete form listed above.

:SYSTem:TRIGger:TRANsmit?

Returns: <discrete>

:SYSTem:TRIGger:TRANsmit:FRAMe <discrete>

<discrete> =	OTN	Start of OTN frame
	SDH	Start of SDH frame
	SONet	Start of SONET frame

Selects the frame type which will generate a trigger output.

For example, when SDH is being transmitted as the payload for OTN, a trigger can be output at the start of either the OTN frame or the SDH frame.

The corresponding query returns the selected start of frame in discrete form listed above.

:SYSTem:TRIGger:TRANsmit:FRAMe?

Returns: <discrete>

Receiver Trigger Output Commands

:SYSTem:TRIGger:RECeive <discrete>

<discrete> =	NONE	No Trigger
	FRAMe	Start of Frame
	ERRor	Specified by Error Add
	ALARm	Specified by Alarm Add

Specifies when to generate a receiver trigger output.

When FRAMe is selected, a further selection of network standard should be selected by :SYSTem:TRIGger:RECeiver:FRAMe.

When ERRor or ALARm are specified, a trigger output is generated when an error or alarm is generated at the receiver.

The corresponding query returns the selected Trigger Output in discrete form listed above.

:SYSTem:TRIGger:RECeive?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:FRAMe <discrete>

<discrete> =	OTN	Start of OTN frame

SDH	Start of SDH frame
SONet	Start of SONET frame

Selects the frame type which will generate a trigger output.

For example, when the instrument is receiving OTN with an SDH payload, a trigger can be output at the start of either the OTN frame or the SDH frame.

The corresponding query returns the selected start of frame in discrete form listed above.

:SYSTem:TRIGger:RECeive:FRAMe?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ERRor:STANdard <discrete>

<discrete> =		
	OTN	OTN Errors
	SECTion	SDH Section Overhead Errors
	TCM	SDH TCM Errors
	TRANsport	SONET Tranport Overhead Errors
	PATH	SDH/SONET Path Overhead Errors

Selects error group when :SYSTem:TRIGger:RECeive is set to ERRor. A further selection is required to set the specific error for trigger output.

The corresponding query returns the selected error group in discrete form listed above.

:SYSTem:TRIGger:RECeive: ERRor:STANdard?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ALARm:STANdard <discrete>

<discrete> =	OTN	OTN Alarms
	SECTion	SDH Section Overhead Alarms
	TCM	SDH TCM Alarms
	TRANsport	SONET Tranport Overhead Alarms
	PATH	SDH/SONET Path Overhead Alarms

Selects alarm group when :SYSTem:TRIGger:RECeive is set to ALARm. A further selection is required to set the specific alarm for trigger output.

The corresponding query returns the selected alarm group in discrete form listed above.

:SYSTem:TRIGger:RECeive:ALARm:STANdard?

Returns: <discrete>

IEEE Common Capabilities

***CLS**

Clear Status - Clears all status registers and the error queue.

***ESE <numeric>**

<numeric> =	1	Operation Complete
	2	Request Control
	4	Query Error
	8	Device Dependent Error
	16	Execution Error
	32	Command Error
	64	User Request
	128	Power On

Event Status Enable - Sets the mask of the Event Status Register.

***ESE?**

<numeric> =	0 to 65535	Current Mask

Event Status Enable Query - Returns the current mask setting.

***ESR?**

<numeric> =	0 to 65535	Event Status Reg Status

Event Status Register Query - Returns the state of the Event Status Register in numeric form.

***IDN?**

<string> =

Identification Query - Returns the Manufacture Name, Model Number & Name, Serial Number, Firmware Revision Number as a string. For example:-

"Agilent Technologies, J21nA PowerPro, GBnnnnnnnn, A.nn.nn" GB signifies the country of origin (Great Britain).

***LRN?**

<#0 block> =

Learn Query - Returns the instrument settings configuration in <#0 Block> form.

***OPC**

Operation Complete - Masks the OPC bit in the Event Status Register when all pending operations have completed.

***OPC?**

<boolean> = Status of Operation Complete

Operation Complete Query - Returns a 1 when all pending operations have completed.

***OPT?**

<string> =

Option Identification Query - Returns the Options fitted in the instrument as a comma separated list of option numbers.

***PSC <numeric>**

Sets the value of the Power On Status Clear flag. Controls the automatic clearing of SRQ Enable register, Standard ESR & Parallel Poll Enable register after power on. See IEE 488.2 Section 10.25.

***PSC?**

<boolean> =

Returns the status of the PSC flag.

***RCL <numeric>**

<numeric> = 0 to 4

Recall Stored Settings - Sets the instrument to a set of previously stored settings.

***RST**

Set the instrument to its Default settings.

***SAV <numeric>**

<numeric> = 0 to 4

Save Stored Settings - Stores the current instrument settings.

***SRE <numeric>**

<numeric> =	8	QUES Status Summary
	16	Message Available
	32	Event Status Summary
	64	Request Service
	128	OPER Status Summary

Service Request Enable - Sets the status byte mask.

***SRE?**

<numeric> = 0 to 65535

Service Request Enable Query - Returns the current mask setting in numeric form.

***STB?**

<numeric> = 0 to 65535

Status Byte Query - Returns the value of the status byte in numeric form.

***TRG**

Trigger - Not implemented on This instrument

***TRG?**

Trigger Query - Not implemented on This instrument

***WAI**

Wait To Continue - Not implemented on the This instrument

***TST**

Initiate Self Test

***TST?**

<boolean> = 1 = selftest in progress

Self Test Query

3

OTN SCPI Command Reference

SOURce subsystem - Transmitter OTN Settings Commands, see page, 3-3
SOURce subsystem - Transmitter OTN Overhead Setup Commands, see page, 3-5
SOURce subsystem - Transmitter Error Test Function , see page, 3-13
SOURce subsystem - Transmitter Alarm Test Functions , see page, 3-21
SOURce subsystem - Transmitter Frequency Offset Commands, see page, 3-26
SOURce subsystem - Transmitter GCC Insert Commands, see page, 3-28
SENSe subsystem - Receiver OTN Settings Commands, see page, 3-29
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SENSe subsystem - Receiver Overhead Monitor Commands, see page, 3-34
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OTN Command Reference

OTN Command Reference

This chapter contains detailed information on the SCPI (Standard Commands for Programming Instruments) and IEEE 488.2 common commands you will use when writing programs to control your Instrument for OTN operation.

Please also refer to chapter 2 Common Commands for general information on SCPI command formats and for a list of commands

SOURce subsystem - Transmitter OTN Settings Commands

:SOURce:DATA:TELecom:OTN:RATE <discrete>

<discrete> =	OTU2	10.71Gb/s

Sets the output rate for the instrument output port.

The corresponding query returns the output port rate in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:RATE?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:SCRambling <boolean>

<boolean> =	0 or OFF	OTN Scrambling Off
	1 or ON	OTN Scrambling On

Enables or Disables OTN Scrambling.

The corresponding query returns the scrambling setting as 0 or 1.

:SOURce:DATA:TELecom:OTN:SCRambling?

Returns: <boolean>

:SOURce:DATA:TELecom:OTN:FEC <boolean>

<boolean> =	0 or OFF	OTN Forward Error Correction Off
	1 or ON	OTN Forward Error Correction On

Enables or Disables OTN Forward Error Correction (FEC).

The corresponding query returns the FEC setting as 0 or 1.

:SOURce:DATA:TELecom:OTN:FEC?

Returns: <boolean>

:SOURce:DATA:TELecom:OTN:MAPPing <discrete>

<discrete> =	ASYNchronous	Asynchronous mapping
	SYNChronous	Synchronous mapping

Sets the mapping used for transmission.

The corresponding query returns the mapping selection in discrete form, as listed above.

:SOURce:DATA:TELecom:OTN:MAPPing?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:PAYLoad <discrete>

<discrete> =	OTN	OTN Payload
	SONet	SONET Payload
	NULLclient	NULL Client Payload
	TEST	Test Payload

Selects the OTN payload.

The corresponding query returns the OTN payload in discrete form, as listed above.

:SOURce:DATA:TELecom:OTN:PAYLoad?

Returns: <discrete>

SOURce subsystem - Transmitter OTN Overhead Setup Commands

Lists the settings for the commands associated with the TRANSMIT OVERHEAD SET UP display. The following commands are only available when an OTN transmit signal rate is active.

Overhead Byte Setup

:SOURce:DATA:TELecom:OTN:OVERhead:DEFault

Sets all overhead bytes to their default value:

:SOURce:DATA:TELecom:OTN:OVERhead:DATA <discrete>,<numeric>

<discrete> = FAS_1 | FAS_2 | FAS_3 | FAS_4 | FAS_5 | FAS_6 | SM_3 | GCC0_1 | GCC0_2 | TCMACT | TCM6_1 | TCM6_3 | TCM5_1 | TCM5_3 | TCM4_1 | TCM4_3 | TCM3_1 | TCM3_3 | TCM2_1 | TCM2_3 | TCM1_1 | TCM1_3 | FTFL | PM_3 | EXP_1 | EXP_2 | GCC1_1 | GCC1_2 | GCC2_1| GCC2_2 | APSPCC_1 | APSPCC_2 | APSPCC_3 | APSPCC_4

<numeric> = 0 to 255 Byte Value

Sets the value of the selected transmitter section overhead byte. The required byte is specified by 2 command parameters.

The first parameter identifies the specific byte. There are two ways of specifying this byte. The first is to use standard names where these are valid. The set of valid names are shown in the table above. The second method is to use an "Xrrcc" notation, where rr is the

numerical value of the row in the OTN overhead and cc is the numerical value of the column in the OTN overhead. This method allows access to any byte in the OTN overhead.

The second command parameter is the new value that will be transmitted in the specified byte. This value can be specified in hex, octal or decimal format.

The corresponding query returns the value set of the byte named within the OTN overhead.

:SOURce:DATA:TELecom:OTN:OVERhead:DATA? <discrete>

Returns: <numeric>

:SOURce:DATA:TELecom:OTN:OVERhead:PM:SAPI:B15 <string>

Sets the 15-byte SAPI field that is used for Path Monitoring (PM).

The corresponding query returns the current value of the SAPI field of the Path Monitoring trace message.

:SOURce:DATA:TELecom:OTN:OVERhead:PM:SAPI:B15?

Returns: <string>

:SOURce:DATA:TELecom:OTN:OVERhead:PM:DAPI:B15 <string>

Sets the 15-byte DAPI field that is used for Path Monitoring (PM).

The corresponding query returns the current value of the DAPI field of the Path Monitoring trace message.

:SOURce:DATA:TELecom:OTN:OVERhead:PM:DAPI:B15?

Returns: <string>

SOURce subsystem - Transmitter OTN Overhead Setup Commands

:SOURce:DATA:TELecom:OTN:OVERhead:PM:OPSPec:B32 <string>

Sets the 32-byte Operator Specific field that is used for Path Monitoring (PM).

The corresponding query returns the current value of the Operator Specific field of the Path Monitoring trace message.

:SOURce:DATA:TELecom:OTN:OVERhead:PM:OPSPec:B32?

Returns: <string>

:SOURce:DATA:TELecom:OTN:OVERhead:SM:SAPI:B15 <string>

Sets the 15-byte SAPI field that is used for Section Monitoring (SM).

The corresponding query returns the current value of the SAPI field of the Section Monitoring trace message.

:SOURce:DATA:TELecom:OTN:OVERhead:SM:SAPI:B15?

Returns: <string>

:SOURce:DATA:TELecom:OTN:OVERhead:SM:DAPI:B15 <string>

Sets the 15-byte DAPI field that is used for Section Monitoring (SM).

The corresponding query returns the current value of the DAPI field of the Section Monitoring trace message.

:SOURce:DATA:TELecom:OTN:OVERhead:SM:DAPI:B15?

Returns: <string>

SOURce subsystem - Transmitter OTN Overhead Setup Commands

:SOURce:DATA:TELecom:OTN:OVERhead:SM:OPSPec:B32 <string>

Sets the 32-byte Operator Specific field that is used for Section Monitoring (SM).

The corresponding query returns the current value of the Operator Specific field of the Section Monitoring trace message.

:SOURce:DATA:TELecom:OTN:OVERhead:SM:OPSPec:B32?

Returns: <string>

:SOURce:DATA:TELecom:OTN:OVERhead:PTYPe <discrete>

<discrete> =	EXPerimental	Experimental Mapping
	ASYNc	Asynchronous STM-Mapping
	BITSync	Bit synchronousSTM-N Mapping
	ATM	ATM Mapping
	GFP	GFP Mapping
	BSOCtet	Bit Stream (with octet timing)
	BSNoctet	Bit Stream (without octet timing)
	NULLtest	NULL test signal mapping
	PRBStest	PRBS test signal mapping
	USER	User defined value

Sets the value of the Payload Type (PT) byte. When USER is selected, the value of the PT byte is specified using the :SOURce:DATA:TELecom:OTN:OVERhead:PTYPe:USER command.

The corresponding query returns the PT byte value, as listed above.

:SOURce:DATA:TELecom:OTN:OVERhead:PTYPe?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:OVERhead:PTYPe:USER <numeric>

<numeric> = 0 to +255 PT Byte Value

Sets the value of the Payload Type (PT) byte to a user defined value.

The corresponding query returns the user defined PT byte value, when specified using the above command.

:SOURce:DATA:TELecom:OTN:OVERhead:PTYPe:USER?

Returns: <numeric>

Overhead Sequence Setup

:SOURce:DATA:TELecom:OTN:SEQuence:OHBYte <discrete>

<discrete> = FAS | MFAS | SM_1 | SM_3 | GCC0 | TCMact | TCM6_1 | TCM6_3 | TCM5_1 | TCM5_3 | TCM4_1 | TCM4_3 | TCM3_1 | TCM3_3 | TCM2_1 | TCM2_3 | TCM1_1 | TCM1_3 | FTFL | PM_1 | PM_3 | EXP GCC1 | GCC2 | APSPcc | Xrrcc

Selects the overhead channel into which the overhead sequence is to be inserted.

The channel may be specified by the channel name (if it exists) or by an 'Xrrcc' notation. 'Xrrcc' specifies a particular overhead byte using a two-digit row (rr) and two-digit column (cc). If the byte is part of a larger channel, then the complete channel is selected. For example, if the user specified 'X0313' then the EXP channel will be accepted.

The following channels cannot be selected for Overhead Sequence generation: SM Byte 2, Tandem Connection Monitoring 1 - 6 (Byte 2), PM Byte 2, Justification Control bytes.

The corresponding query returns the selected sequence channel in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:SEQuence:OHBYte? >

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:SEQuence:DEFault

Restores all sequence variables to their default values.

:SOURce:DATA:TELecom:OTN:SEQuence:INCRement

Resets the sequence repeat counts and data values and inserts incrementing values.

:SOURce:DATA:TELecom:OTN:SEQuence:FCOunt <numeric>,<numeric>

<numeric> =	1 to 256	Sequence Element Index
<numeric> =	0 to 65535	Sequence Element Repeat Count

Selects the number of frames in which the element data (specified by the element index) is to be transmitted.

The corresponding query returns the frame count for the specified sequence element.

:SOURce:DATA:TELecom:OTN:SEQuence:FCOunt? <numeric>

Returns: <numeric> Frame count

:SOURce:DATA:TELecom:OTN:SEQuence:DATA <numeric>,<string>

<numeric> =	1 to 256
<string>	See Below

Sets the Sequence data pattern for the designated element to the hexadecimal value contained in the string. The number of hexadecimal characters is

dependent on the overhead channel selected by :SOURce:DATA:TELecom:OTN:SEQuence:OHBYte. Two hexadecimal characters are required per byte, for example:

TCMACT - 1 byte "00" to "FF"

FAS - 6 bytes "000000000000" to "FFFFFFFFFFFF"

The corresponding query returns the data for the specified sequence element in string form.

:SOURce:DATA:TELecom:OTN:SEQuence:DATA? <numeric>

<numeric> =	1 to 256	

Returns: <string>

:SOURce:DATA:TELecom:OTN:SEQuence:MODE <discrete>

<discrete> =	SINGle	Single Run
	REPeat	Repeat Run

Selects whether to run a sequence once or repeatedly.

The corresponding query returns the type of Sequence in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:SEQuence:MODE?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:SEQuence <discrete>

<discrete> =	STOP	Stop current sequence
	STARt	Start new sequence

Stops or starts a Single or Repeat run Sequence.

The corresponding query returns the Sequence status in discrete form as listed above.

SOURce subsystem - Transmitter OTN Overhead Setup Commands

:SOURce:DATA:TELecom:OTN:SEQuence?

Returns: <discrete>

SOURce subsystem - Transmitter Error Test Function

:SOURce:DATA:TELecom:OTN:ERRor:GROup <discrete>

<discrete> =	PHYSical	Physical Errors
	OTN	OTN Errors
	SECTion	SDH Section Overhead Errors
	TRANsport	SONET Transport Overhead Errors
	PATH	SDH/SON Path Errors
	TCM	SDH Tandem Connection Monitor Errors
	PATTern	Pattern Errors

Selects OTN transmit test function Error Group. Further selection of :SOURce:DATA:TELecom:OTN:ERRor:RATE is required. Selection of PATTern results in BIT error type being selected.

The corresponding query returns the Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:ERRor:GROup?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ERRor:OTN <discrete>

<discrete> =	FRAMe	Frame Error
	MFAS	MFAS Error
	TBIP8	OTU BIP8 Error
	TBEI	OTU BEI Error
	DBIP8	ODU BEI Error
	DBEI	ODU BEI Error
	UFEC	Uncorrectable FEC Error

Selects OTN Error Type to generate. Further selection of :SOURce:DATA:TELecom:OTN:ERRor:RATE is required.

The corresponding query returns the OTN Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:ERRor:OTN?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ERRor:SECTion <discrete>

<discrete> =	FRAMe	A1A2 Frame Errors
	RSBip	RS-BIP, B1 Errors
	MSBip	MS-BIP, B2 Errors
	MSRei	MS-REI Errors

Selects Section Error Type to generate. Further selection of :SOURce:DATA:TELecom:OTN:ERRor:RATE is required.

The corresponding query returns the Section Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:ERRor:SECTion?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ERRor:TRANsport <discrete>

<discrete> =	FRAMe	A1A2 frame errors
	CVS	CV-S (Section B1 BIP) Errors
	CVL	CV-L (Line B2 BIP) Errors
	REIL	REI-L (Line FEBE) Errors

Selects Transport Error Type to generate. Further selection of :SOURce:DATA:TELecom:OTN:ERRor:RATE is required.

The corresponding query returns the Transport Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:ERRor:TRANsport?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ERRor:PATH <discrete>

<discrete> =	PBIP	SDH Path Bip, B3 Errors
	HPRei	SDH HP-REI Errors
	CVP	SONET Path Bip Errors
	REIP	SONET REI-P Errors

Selects Path Error Type to generate. Further selection of :SOURce:DATA:TELecom:OTN:ERRor:RATE is required.

The corresponding query returns the Path Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:ERRor:PATH?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ERRor:TCM <discrete>

<discrete> =	TCIec	TCM Incoming Error Count
	TCRei	TCM REI
	OEI	TCM Outgoing Error Indication

Selects TCM Error Type to generate. Further selection of :SOURce:DATA:TELecom:OTN:ERRor:RATE is required.

The corresponding query returns the TCM Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:ERRor:TCM?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ERRor:PATTern <discrete>

<discrete> = BIT

Selects Pattern Error Type to generate. Further selection of:SOURce:DATA:TELecom:OTN:ERRor:RATE is required.

The corresponding query returns the Pattern Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:ERRor:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:ERRor:SINGle

Injects a single error.

There is no corresponding query.

:SOURce:DATA:TELecom:OTN:ERRor:RATE <discrete>

<discrete> =		
	NONE	Errors Off
	EALL	Error All
	APSThreshold	APS Threshold (MS Bit only)
	E_3	Line rate dependent
	E_4	Line rate dependent
	E_5	Line rate dependent
	E_6	
	E_7	
	E_8	
	E_9	
	USER	User defined error rate

Selects the transmitter Error Rate of the error type (with the exception of EFRame and FRAMe selections) selected by the Error Group Selection Functions.

The corresponding query returns the selected transmitter Error Rate in discrete form, as listed above.

Note

If this query returns USER, then :SOURce:DATA:TELecom:OTN:ERRor:RATE:USER? must be used to discover the currently injected error rate.

:SOURce:DATA:TELecom:OTN:ERRor:RATE?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ERRor:RATE:USER <numeric>

<numeric>=	9.9E-9 to 1.1E-3	mantissa resolution 0.1, exponent resolution 1

Sets the user defined Error Add rate. :SOURce:DATA:TELecom:OTN:ERRor:RATE must be set to USER

Note

The maximum user defined error rate is dependent on both error type and line rate.

The corresponding query returns the User Error Rate as a numeric.

:SOURce:DATA:TELecom:OTN:ERRor:RATE:USER?

Returns: <numeric>

:SOURce:DATA:TELecom:OTN:ERRorRATE:USER:ACTion <boolean>

<boolean>=	0 or OFF	
	1 or ON	User Value set as Error Rate

Sets the user defined Error Add rate specified by :SOURce:DATA:TELecom:OTN:ERRor:RATE:USER.The corresponding query returns the boolean state of the User Rate.

:SOURce:DATA:TELecom:OTN:ERRor:RATE:USER:ACTion?

Returns: <boolean>

:SOURce:DATA:TELecom:OTN:ERRor:RATE:FRAMe <discrete>

<discrete> =	NONE	Errors Off
	ONE	1 in 4
	TWO	2 in 4
	THRee	3 in 4
	FOUR	4 in 4

Selects the transmitter Frame Error Rates of the error type EFRame and FRAMe.

The corresponding query returns the selected transmitter Frame Error Rate in discrete form, as listed above.

:SOURce:DATA:TELecom:OTN:ERRor:RATE:FRAMe?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ERRor:APSThreshold:NERRors <numeric>

<numeric> =	0 to 640	for STM-0
	0 to 1920	for STM-1
	0 to 7680	for STM-4
	0 to 30720	for STM-16
	0 to 122880	for STM-64

Sets the number of errors for the APS Threshold when :SOURce:DATA:TELecom:OTN:ERRor:RATE is set to APSThreshold. Default = 0.

The corresponding query returns the number of errors selected for the APS Threshold in numeric form.

:SOURce:DATA:TELecom:OTN:ERRor:APSThreshold:NERRors?

Returns: <numeric>

:SOURce:DATA:TELecom:OTN:ERRor:APSThreshold:EINTerval <discrete>

<discrete> =	MS10	10 milliseconds
	MS100	100 milliseconds
	S1	1 second
	S10	10 seconds
	S100	100 seconds
	S1000	1,000 seconds

Sets the interval between APS Threshold errors when :SOURce:DATA:TELecom:OTN:ERRor:RATE is set to APSThreshold .

The corresponding query returns the APS Threshold error interval in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:ERRor:APSThreshold:EINTerval?

Returns: <discrete>

SOURce subsystem - Transmitter Alarm Test Functions

:SOURce:DATA:TELecom:OTN:ALARm:GROup <discrete>

<discrete> =		
	PHYSical	Physical Alarms
	OTN	OTN Alarms
	SECTion	SDH Section Overhead Alarms
	TRANsport	SONET Transport Overhead Alarms
	PATH	SDH/SONET Path Overhead Alarms
	TCM	SDH Tandem Connection Monitor Alarms

Selects Alarm Group. Further selections from the group alarms must be made using :SOURce:DATA:TELecom:OTN:ALARm:PHYSical , :SOURce:DATA:TELecom:OTN:ALARm:OTN…etc, and finally :SOURce:DATA:TELecom:ALARm should be set to ON to activate the alarm selected.

The corresponding query returns the Alarm Group selected in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:ALARm:GROup?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ALARm:PHYSical <discrete>

<discrete> =		
	LOS	Loss of Signal Alarm

Selects PHYSical Alarms.

The corresponding query returns the PHYSical Alarm selected in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:ALARm:PHYSical?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ALARm:OTN <discrete>

<discrete> =	LOF	Loss of Frame
	OOF	Out of Frame
	LOM	Loss of Multiframe
	OOM	Out of Multiframe
	TAIS	OTU-AIS
	IAE	OTU-IAE
	TBDI	OTU-BDI
	DAIS	ODU-AIS
	OCI	ODU-OCI
	LCK	ODU-LCK
	DBDI	ODU-BDI

Selects OTN-Specific Alarms. OOF and OOM alarms are transmitted using the commands
:SOURce:DATA:TELecom:OTN:ALARm:OOF and
:SOURce:DATA:TELecom:OTN:ALARm:PHYSical

The corresponding query returns the OTN Alarm selected in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:ALARm:OTN?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ALARm:SECTion <discrete>

<discrete> =	LOF	Loss of Frame
	OOF	Out of Frame
	MSAis	MS-AIS alarm indication signal
	MSRDi	MS-RDI remote defect indication

Selects Section Overhead alarms.

The corresponding query returns the Section Overhead alarm selected in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:ALARm:SECTion?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ALARm:TRANsport <discrete>

<discrete> =	LOF	Loss of Frame
	SEF	Severely Errored Frame
	AISL	AIS-L alarm indication signal
	RDIL	RDI-L remote defect indication

Selects Transport Alarms.

The corresponding query returns the Transport Alarm selected in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:ALARm:TRANsport?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ALARm:PATH <discrete>

<discrete> =	PAIS	SDH Path AIS
	AULop	SDH AU-LOP Loss of AU pointer
	HPRDi	SDH HP-RDI remote defect indication
	AISP	SONET Path AIS
	LOPP	SONET LOP-P Alarm
	HPRDi	SONET RDI-P Alarm
	PUNequipped	SDH/SONET Path Unequipped

Selects Path Alarms.

The corresponding query returns the Path Alarm selected in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:ALARm:PATH?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ALARm:TCM <discrete>

<discrete> =	TCRDi	TCM remote defect indication
	ODI	outgoing defect indication
	TCOom	TCM loss of multi-frame alignment
	IAIS	Incoming alarm indication signal
	VCAis	VC alarm indication signal
	TCUNeq	TCM unequiped

Selects Tandem Connection Mode Alarms.

The corresponding query returns the TCM Alarm selected in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:ALARm:TCM?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ALARm:HERDI <discrete>

<discrete> =	OFF	HI Path RDI no defect, non-enhanced
	PAYLoad	HI Path RDI payload enhanced
	SERVer	HI Path RDI server defect enhanced
	CONNection	HI Path RDI connection enhanced

Selects HI Path Enhanced RDI Alarm state.

The corresponding query returns the HI Path Enhanced RDI Alarm state selected in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:ALARm:HERDI?

Returns: <discrete>

:SOURce:DATA:TELecom:ALARm <boolean>

<boolean> = 0 or OFF
1 or ON

Enables and disables Alarm Generation.

The corresponding query returns the Alarm Generation state as 0 or 1.

:SOURce:DATA:TELecom:ALARm?

Returns: <boolean>

:SOURce:DATA:TELecom:OTN:ALARm:OOF

Sets the OOF alarm Active.There is no corresponding query

:SOURce:DATA:TELecom:OTN:ALARm:OOM

Sets the OOM alarm Active.There is no corresponding query

SOURce subsystem - Transmitter Frequency Offset Commands

:SOURce:CLOCk:OTN:FOFFset <boolean>

<boolean> = 0 or OFF
1 or ON

Enables or disables the Clock Frequency Offset. The amount of Offset is set using :SOURce:CLOCk:OTN:FOFFset:OFFSet.

The corresponding query returns the Clock Frequency Offset active state as 0 or 1.

:SOURce:CLOCk:OTN:FOFFset?

Returns: <boolean>

:SOURce:CLOCk:OTN:FOFFset:OFFSet <numeric>

<numeric> = -90.00 to+90.00 ppm for all rates

Sets the amount of Clock Frequency Offset when Frequency Offset is enabled by setting :SOURce:CLOCk:OTN:FOFFset to ON.

The corresponding query returns the amount of Clock Frequency Offset in parts per million.

:SOURce:CLOCk:OTN:FOFFset:OFFSet?

Returns: <numeric>

:SOURce:CLOCk:OTN:FOFFset:OPU <boolean>

<boolean> = 0 or OFF
1 or ON

Enables or disables the OPU Clock Frequency Offset. The amount of Offset is set using :SOURce:CLOCk:OTN:FOFFset:OPU:OFFSet.

The corresponding query returns the OPU Clock Frequency Offset active state as 0 or 1.

:SOURce:CLOCk:OTN:FOFFset:OPU?

Returns: <boolean>

:SOURce:CLOCk:OTN:FOFFset:OPU:OFFSet <numeric>

<numeric> = -90.00 to +90.00 ppm for all rates

Sets the amount of OPU Clock Frequency Offset when Frequency Offset is enabled by setting :SOURce:CLOCk:OTN:FOFFset:OPU to ON.

The corresponding query returns the amount of OPU Clock Frequency Offset in parts per million.

:SOURce:CLOCk:OTN:FOFFset:OPU:OFFSet?

Returns: <numeric>

SOURce subsystem - Transmitter GCC Insert Commands

:SOURce:DATA:TELecom:OTN:IGCC <discrete>

<discrete> =	NONE	Turns GCC Insertion Off
	GCC0	Insert OTU GCC0
	GCC1	Insert ODU GCC1
	GCC2	Insert ODU GCC2

Selects the General Communications Channel to be inserted for GCC test function.

The corresponding query returns the selected port in discrete form as listed above.

:SOURce:DATA:TELecom:OTN:IGCC?

Returns: <discrete>

SENSe subsystem - Receiver OTN Settings Commands

:SENSe:DATA:TELecom:OTN:RATE <discrete>

<discrete> =	OTU2	10.71Gb/s

Sets the input rate for the instrument input port.

The corresponding query returns the rate selected in discrete form as listed above.

:SENSe:DATA:TELecom:OTN:RATE?

Returns: <discrete>

:SENSe:DATA:TELecom:OTN:SCRambling <boolean>

<boolean> =	0 or OFF	OTN Scrambling Off
	1 or ON	OTN Scrambling On

Enables or Disables OTN Scrambling.

The corresponding query returns the scrambling setting as 0 or 1.

: SENSe:DATA:TELecom:OTN:SCRambling?

Returns: <boolean>

: SENSe:DATA:TELecom:OTN:FEC <boolean>

<boolean> =	0 or OFF	OTN Forward Error Correction Off
	1 or ON	OTN Forward Error Correction On

Enables or Disables OTN Forward Error Correction (FEC).

The corresponding query returns the FEC setting as 0 or 1.

: SENSe:DATA:TELecom:OTN:FEC?

Returns: <boolean>

: SENSe:DATA:TELecom:OTN:MAPPing <discrete>

<discrete> =	ASYNchronous	Asynchronous mapping
	SYNChronous	Synchronous mapping

Sets the mapping as asynchronous or synchronous.

The corresponding query returns the mapping selection in discrete form, as listed above.

: SENSe:DATA:TELecom:OTN:MAPPing?

Returns: <discrete>

: SENSe:DATA:TELecom:OTN:PAYLoad <discrete>

<discrete> =	OTN	OTN Payload
	SONet	SONET Payload
	NULLclient	NULL Client Payload
	TEST	Test Payload

Selects the OTN payload.

The corresponding query returns the OTN payload in discrete form, as listed above.

: SENSe:DATA:TELecom:OTN:PAYLoad?

Returns: <discrete>

SENSe subsystem - Receiver GCC Drop Commands

:SENSe:DATA:TELecom:OTN:DGCC <discrete>

<discrete> =	NONE	Turns GCC Drop Off
	GCC0	Drop OTU GCC0
	GCC1	Drop ODU GCC1
	GCC2	Drop ODU GCC2

Selects the General Communications Channel to be dropped for GCC test function.

The corresponding query returns the selected GCC, in discrete form as listed above.

:SENSe:DATA:TELecom:OTN:DGCC?

Returns: <discrete>

SENSe subsystem - Data Capture Commands

The following commands are used to configure data capture for OTN. General commands for data capture are found in the Common Commands chapter.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:OTN <discrete>

<discrete> =	FRAMe	FAS Error
	MFAS	MFAS Error
	TBIP8	OTU BIP8 Error
	TBEI	OTU BEI Error
	DBIP8	ODU BIP8 Error
	DBEI	ODU BEI Error
	CFEC	Correctable FEC Errors
	UFEC	Uncorrectable FEC Errors

Selects OTN error for triggering data capture.

The corresponding query returns the selected OTN error in discrete form listed above.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:OTN?

Returns: <discrete>

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:OTN <discrete>

<discrete> =	LOF	Loss of Frame
	OOF	Out of Frame
	LOM	Loss of Multiframe
	OOM	Out of Multiframe
	TAIS	OTU-AIS
	IAE	OTU-IAE

TBDI	OTU-BDI
DAIS	ODU-AIS
OCI	ODU-OCI
LCK	ODU-LCK
DBDI	ODU-BDI

Selects OTN alarm for triggering data capture.

The corresponding query returns the selected OTN alarm in discrete form listed above.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:OTN?

Returns: <discrete>

SENSe subsystem - Receiver Overhead Monitor Commands

:SENSe:DATA:TELecom:OTN:OCAPture:OHBYte <discrete>

<discrete> = FAS | MFAS | SM_1 | SM_3 | GCC0 | TCMact | TCM6_1 | TCM6_3 | TCM5_1 | TCM5_3 | TCM4_1 | TCM4_3 | TCM3_1 | TCM3_3 | TCM2_1 | TCM2_3 | TCM1_1 | TCM1_3 | FTFL | PM_1 | PM_3 | EXP GCC1 | GCC2 | APSPcc | Xrrcc

Selects the overhead channel to be captured.

The channel may be specified by the channel name (if it exists) or by an 'Xrrcc' notation. 'Xrrcc' specifies a particular overhead byte using a two-digit row (rr) and two-digit column (cc). If the byte is part of a larger channel, then the complete channel is selected. For example, if the user specifies 'X0313' then the EXP channel will be accepted.

The following channels cannot be selected for Overhead Capture: SM Byte 2, Tandem Connection Monitoring 1 - 6 (Byte 2), PM Byte 2, Justification Control bytes.

The corresponding query returns the selected overhead capture channel in discrete form as listed above.

:SENSe:DATA:TELecom:OTN:OCAPture:OHBYte?

Returns: <discrete>

:SENSe:DATA:TELecom:OTN:OCAPture:TRIGger:SELection <discrete>

<discrete> =		
	MANual	Manual trigger
	PRE	Pre-trigger capture
	CENTered	Centre-trigger capture
	POST	Post-trigger capture

Selects the type of trigger for Overhead Capture.

When MANual trigger is selected, capture is started using the :SENSe:DATA:TELecom:OTN:OCAPture command. PRE-trigger capture will capture up to 255 elements before the trigger pattern (:SENSe:DATA:TELecom:OTN:OCAPture:TRIGger:PATTern). CENTered capture captures elements either side of the trigger pattern. POST capture captures up to 255 elements after the trigger pattern.

The corresponding query returns the selected overhead capture trigger selection in discrete form as listed above.

:SENSe:DATA:TELecom:OTN:OCAPture:TRIGger:SELection?

Returns: <discrete>

:SENSe:DATA:TELecom:OTN:OCAPture:TRIGger:POLarity <discrete>

<discrete> =	ON	Triggers when capture data MATCHES trigger pattern
	ONNot	Triggers when capture data DOES NOT MATCH trigger pattern

Selects whether the trigger will start capture on data matching the trigger pattern or not matching the trigger pattern.

The corresponding query returns the selected trigger polarity.

:SENSe:DATA:TELecom:OTN:OCAPture:TRIGger:POLarity?

Returns: <discrete>

:SENSe:DATA:TELecom:OTN:OCAPture:TRIGger:PATTern <string>

<string> See Below

Sets the overhead capture trigger pattern as a string of hexadecimal digits. The number of hexadecimal characters is dependent on the overhead channel selected by :SENSe:DATA:TELecom:OTN:OCAPture:OHBYte. Two hexadecimal characters are required per byte, for example:

TCMACT - 1 byte "00" to "FF"

FAS - 6 bytes "000000000000" to "FFFFFFFFFFFF"

The corresponding query returns the current value of the trigger pattern in string form.

:SENSe:DATA:TELecom:OTN:OCAPture:TRIGger:PATTern?

Returns: <string> e.g.: "FF..FF"

:SENSe:DATA:TELecom:OTN:OCAPture:TRIGger:MASK <string>

<string> See Below

Sets the mask for the overhead capture trigger as a string of hexadecimal characters. Allows certain bits of the trigger pattern to masked. The number of hexadecimal characters is dependent on the overhead channel selected by :SENSe:DATA:TELecom:OTN:OCAPture:OHBYte.

The corresponding query returns the trigger mask in string form.

:SENSe:DATA:TELecom:OTN:OCAPture:TRIGger:MASK?

Returns: <string>

:SENSe:DATA:TELecom:OTN:OCAPture <discrete>

<discrete> =	STOP	Stop current current
	STARt	Start new capture

Stops or starts overhead sequence capture.

The corresponding query returns the capture status in discrete form as listed above.

:SENSe:DATA:TELecom:OTN:OCAPture?

Returns: <discrete>

SENSe subsystem - Result Returning Commands

OTN Last second Results

:SENSe:DATA? <string>

<string> = **"ECOunt:OTN:LSECond:<error>"** <error> is one of the following

FRAMe	Frame error count
MFRame	MFAS error count
CFEC	Correctable FEC error count
UFEC	Uncorrectable FEC error count

<string> = **"ERATio:OTN:LSECond:<error>"** <error> is one of the following

FRAMe	Frame error ratio
MFRame	MFAS error ratio
CFEC	Correctable FEC error ratio
UFEC	Uncorrectable FEC error ratio

Returns: <numeric>

OTU Last second Results

:SENSe:DATA? <string>

<string> = **"ECOunt:OTU:LSECond:<error>"** <error> is one of the following

BIP8	OTU BIP8 error count
BEI	BEI error count

<string> = **"ERATio:OTU:LSECond:<error>"** <error> is one of the following

BIP8	OTU BIP8 error ratio
BEI	BEI error ratio

Returns: <numeric>

ODU Last second Results

:SENSe:DATA? <string>

<string> = **"ECOunt:ODU:LSECond:<error>"** <error> is one of the following

BIP8	ODU BIP8 error count
BEI	BEI error count

<string> = **"ERATio:ODU:LSECond:<error>"** <error> is one of the following

BIP8	ODU BIP8 error ratio
BEI	BEI error ratio

Returns: <numeric>

OTN Total Results

:SENSe:DATA? <string>

<string> = **"ECOunt:OTN:<error>"** <error> is one of the following

FRAMe	Frame error count
MFRame	MFAS error count
CFEC	Correctable FEC error count
UFEC	Uncorrectable FEC error count

<string> = **"ERATio:OTN:<error>"** <error> is one of the following

FRAMe	Frame error ratio
MFRame	MFAS error ratio
CFEC	Correctable FEC error ratio
UFEC	Uncorrectable FEC error ratio

Returns: <numeric>

OTU Total Results

:SENSe:DATA? <string>

<string> = **"ECOunt:OTU:<error>"** <error> is one of the following

BIP8	OTU BIP8 error count
BEI	BEI error count

<string> = **"ERATio:OTU:<error>"** <error> is one of the following

BIP8	OTU BIP8 error ratio
BEI	BEI error ratio

Returns: <numeric>

ODU Total Results

:SENSe:DATA? <string>

<string> = **"ECOunt:ODU:<error>"** <error> is one of the following

BIP8	ODU BIP8 error count

BEI	BEI error count

<string> = **"ERATio:ODU:<error>"** <error> is one of the following

BIP8	ODU BIP8 error ratio
BEI	BEI error ratio

Returns: <numeric>

OTN Alarm Seconds Results

:SENSe:DATA? <string>

<string> = **"ASEConds:OTN:<alarm>"** <alarm> is one of the following

LOF	Loss Of Frame
OOF	Out Of Frame
LOM	Loss of Multi-Frame
OOM	Out Of Multi-Frame

Returns: <numeric>

OTU Alarm Seconds Results

:SENSe:DATA? <string>

<string> = **"ASEConds:OTU:<alarm>"** <alarm> is one of the following

AIS	Alarm Indication Signal
BDI	Backward Defect Indication
IAE	Incoming Alignment Error

Returns: <numeric>

ODU Alarm Seconds Results

:SENSe:DATA? <string>

<string> = **"ASEConds:ODU:<alarm>"** <alarm> is one of the following

AIS	Alarm Indication Signal

OCI	Open Connection Indication
LCK	Locked
BDI	Backward Defect Indication

Returns: <numeric>

Implied Payload Offset Result

:SENSe:DATA? <string>

<string> = **"OTN:OPU:IOFFset"**

Returns: <numeric>

FETCh subsystem

The FETCh subsystem is used to retrieve data directly accumulated by the instrument.

OTN Overhead Monitor

:FETCh:ARRay:DATA:TELecom:OTN:OVERhead:DATA?

Returns the value of the OTN overhead as a comma seperated list of 64 integer numerical values in the range 0 to 255.

Returns: <numeric>, <numeric>,.....<numeric>

The values are arranged as shown

<row1 col1>,<row1 col2>,<row1 col3>.. ..<row1 col16>,
<row2 col1>.....
....<row3 col16>,
<row4 col1>,<row4 col2>,<row4 col3>.. ..<row4 col16>

:FETCh:SCALar:DATA:TELecom:OTN:OVERhead:DATA? <discrete>

<discrete> = FAS_1 | FAS_2 | FAS_3 | FAS_4 | FAS_5 | FAS_6 | SM_3 | GCC0_1 | GCC0_2 | TCMACT | TCM6_1 | TCM6_3 | TCM5_1 | TCM5_3 | TCM4_1 | TCM4_3 | TCM3_1 | TCM3_3 | TCM2_1 | TCM2_3 | TCM1_1 | TCM1_3 | FTFL | PM_3 | EXP_1 | EXP_2 | GCC1_1 | GCC1_2 | GCC2_1| GCC2_2 | APSPCC_1 | APSPCC_2 | APSPCC_3 | APSPCC_4

Returns: <numeric>

Returns the value of a single named byte of the OTN overhead. The required byte is specified by 1 command parameter.

The parameter identifies the specific byte. There are two ways of specifying this byte. The first is to use standard names where these are valid. The set of valid names is shown in the table above. The second method is to use an "Xrrcc" notation, where rr is the numerical value of the row in the OTN overhead and cc is the numerical value of the column in the OTN overhead. For example, X0204 references the TCMACT byte. This method allows access to any byte in the OTN overhead.

OTN Overhead Trace Messages

:FETCh:ARRay:DATA:TELecom:OTN:OVERhead:PM:SAPI?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the Path Monitoring SAPI bytes as an array of 16 numeric values. Each numeric is in the range 0 to 255.

:FETCh:ARRay:DATA:TELecom:OTN:OVERhead:PM:DAPI?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the Path Monitoring DAPI bytes as an array of 16 numeric values. Each numeric is in the range 0 to 255.

:FETCh:ARRay:DATA:TELecom:OTN:OVERhead:PM: OPSPec?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the Path Monitoring Operator Specific bytes as an array of 32 numeric values. Each numeric is in the range 0 to 255.

:FETCh:ARRay:DATA:TELecom:OTN:OVERhead:SM:SAPI?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the Section Monitoring SAPI bytes as an array of 16 numeric values. Each numeric is in the range 0 to 255.

:FETCh:ARRay:DATA:TELecom:OTN:OVERhead:SM:DAPI?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the Section Monitoring DAPI bytes as an array of 16 numeric values. Each numeric is in the range 0 to 255.

:FETCh:ARRay:DATA:TELecom:OTN:OVERhead:SM:OPSPec?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the Section Monitoring Operator Specific bytes as an array of 32 numeric values. Each numeric is in the range 0 to 255.

:FETCh:STRing:DATA:TELecom:OTN:PM:SAPI?

Returns: <string>

Returns the value of the Path Monitoring SAPI field as a 15 ASCII character string. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:OTN:PM:DAPI?

Returns: <string>

Returns the value of the Path Monitoring DAPI field as a 15 ASCII character string. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:OTN:PM:OPSPec?

Returns: <string>

Returns the value of the Path Monitoring Operator Specific field as a 32 ASCII character string. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:OTN:SM:SAPI?

Returns: <string>

Returns the value of the Section Monitoring SAPI field as a 15 ASCII character string. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:OTN:SM:DAPI?

Returns: <string>

Returns the value of the Section Monitoring DAPI field as a 15 ASCII character string. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:OTN:SM:OPSPec?

Returns: <string>

Returns the value of the Section Monitoring Operator Specific field as a 32 ASCII character string. If the string contains any non printing characters then ~ is substituted.

:FETCh:SCALar:DATA:TELecom:OTN:OVERhead:PTYPe?

Returns: <numeric>

Returns the value of the Payload Type byte as an integer.

OTN Data Capture

**:FETCh:SCALar:DATA:TELecom:OTN:DCAPture:OHData?
<numeric>,<discrete>**

<numeric> = Frame Index

<discrete> = Overhead Byte Name

Returns: <numeric>

Returns the value of the specified overhead byte within the captured frame.

**:FETCh:SCALar:DATA:TELecom:OTN:DCAPture:DATA?
<numeric>,<numeric>,<numeric>**

<numeric> = Frame Index.

<numeric> = Row Index (Min = 1, Max = 4)

<numeric> = Column Index (Min = 1, Max = 4080)

Returns: <numeric>

Returns the value of the specified byte anywhere within and an OTN frame.

**:FETCh:ARRay:DATA:TELecom:OTN:DCAPture:DATA?
<numeric>,<numeric>,<numeric>**

<numeric> = Frame Index.

<numeric> = Start Column

<numeric> = End Column

Returns: <numeric>,<numeric>...<numeric>

Returns a comma separated list of byte values from the specified start column through to the specified end column.

<start_column, row1>, <start_column, row2>,

<start_column, row3>, <start_column, row4>, <start_column+1, row1>,
<start_column+1, row2>, <start_column+1, row3>, <start_column+1, row4>,
.....
<end_column, row1>, <end_column, row2>,
<end_column, row3>, <end_column, row4>

OTN Overhead Sequence Capture

:FETCh:SCALar:DATA:TELecom:OTN:OCAPture:MINelement?

Returns: <numeric>

Returns the minimum element index of the captured sequence.

:FETCh:SCALar:DATA:TELecom:OTN:OCAPture:MAXelement?

Returns: <numeric>

Returns the maximum element index of the captured sequence.

:FETCh:SCALar:DATA:TELecom:OTN:OCAPture:FCOunt? <numeric>

<numeric> = Element Index

Returns: <numeric>

Returns the capture repeat count of the specified element in numeric form. Individual elements may be captured up to 65535 times before a new element is entered into the captured sequence.

The sequence element index (numeric parameter) can be in the range -255 to +255 depending on the trigger selection.

The element which triggered sequence capture (the element that met the trigger criteria) is specified by index 0. Since 256 elements may be captured, pre-trigger can capture elements indexed -255 to 0 whilst post-trigger capture can capture elements indexed 0 to +255.

:FETCh:STRing:DATA:TELecom:OTN:OCAPture:DATA? <numeric>

<numeric> = Element Index.

Returns: <string>

Returns the capture data of the specified element in string form. The data is represented by hexadecimal characters. The number of characters depends on the selected capture channel.

:FETCh:ARRay:DATA:TELecom:OTN:OCAPture? <numeric>

<numeric> = Number of elements to return.

Returns: <array>

Returns an array with the number of entries determined by <numeric> and seperated by CR/LF.

Each entry consists of an alphanumeric string and a numeric seperated by commas. The alphanumeric string provides the hexadecimal value of the captured data. The length of the string depends upon the overhead channel selected for capture, two hexadecimal characters/overhead byte. The numeric indicates indicates the number of frames for which the captured data existed. If this command is issued when a capture is being performed, some entries will contain no data. In this case 9.91E+37 is returned.

SYSTem Subsystem - Trigger Output OTN Commands

:SYSTem:TRIGger:RECeive:ERRor:OTN <discrete>

<discrete> =		
	FRAMe	FAS Error
	MFAS	MFAS Error
	TBIP8	OTU BIP8 Error
	TBEI	OTU BEI Error
	DBIP8	ODU BIP8 Error
	DBEI	ODU BEI Error
	CFEC	Correctable FEC Errors
	UFEC	Uncorrectable FEC Errors

Selects OTN error for trigger output when :SYSTem:TRIGger:RECeive:ERRor:STANdard is set to OTN.

The corresponding query returns the selected OTN error in discrete form listed above.

:SYSTem:TRIGger:RECeive:ERRor:OTN?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ALARm:OTN <discrete>

<discrete> =		
	LOF	Loss of Frame
	OOF	Out of Frame
	LOM	Loss of Multiframe
	OOM	Out of Multiframe
	TAIS	OTU-AIS
	IAE	OTU-IAE
	TBDI	OTU-BDI
	DAIS	ODU-AIS
	OCI	ODU-OCI

LCK	ODU-LCK
DBDI	ODU-BDI

Selects OTN alarm for trigger output when :SYSTem:TRIGger:RECeive:ALARm:STANdard is set to OTN.

The corresponding query returns the selected OTN alarm in discrete form listed above.

:SYSTem:TRIGger:RECeive:ALARm:OTN?

Returns: <discrete>

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SDH SCPI Command Reference

SOURce subsystem - Transmitter SDH Settings Commands, see page, 4-4

SOURce subsystem - Transmitter SDH Overhead Set Up, see page, 4-15

SOURce subsystem - Transmitter Error Test Functions, see page, 4-36

SOURce subsystem - Transmitter Alarm Test Functions, see page, 4-45

SOURce subsystem - Pointer Adjust Test Functions, see page, 4-49

SOURce subsystem - Frequency Offset Test Functions, see page, 4-54

SENSe subsystem - Receiver SDH Settings, see page, 4-63

SENSe subsystem - Receiver SDH Test Function Commands, see page, 4-70

SENSe subsystem – Result Returning Commands, see page, 4-78

FETCh subsystem , see page, 4-86

SDH Command Reference

SDH Command Reference

This chapter contains detailed information on the SCPI (Standard Commands for Programming Instruments) and IEEE 488.2 common commands you will use when writing programs to control your Instrument for SDH operation.

Please also refer to chapter 2 Common Commands for general information on SCPI command formats and for a list of commands

OUTPut subsystem

:OUTPut:TELecom:SDH:PAYLoad:LOCation <discrete>

<discrete> = INTernal
EXTernal

This command selects the SDH transmitter payload location

The corresponding query returns the SDH transmitter payload location in discrete form as listed above.

:OUTPut:TELecom:SDH:PAYLoad:LOCation?

Returns: <discrete>

:OUTPut:TELecom:SDH:DROP:CODE <discrete>

<discrete> =		
	NRZ	optical only
	CMI	140Mb/s only
	B3ZS	DS3
	HDB3	34Mb/s,8Mb/s,2Mb/s
	B8ZS	DS1
	AMI	DS1

Selects the SDH drop interface line code for the SDH payload.

The corresponding query returns the SDH drop interface line code in discrete form as listed above.

:OUTPut:TELecom:SDH:DROP:CODE?

Returns: <discrete>

SOURce subsystem - Transmitter SDH Settings Commands

:SOURce:DATA:TELecom:SDH:RATE <discrete>

Controls the characteristics of the instrument's output ports.

<discrete> =	STM64	10Gb/s
	STM16	2.5Gb/s
	STM4	622Mb/s
	STM1	155Mb/s
	STM0	51Mb/s

Sets the output rate for the instrument output port.

The corresponding query returns the output port rate in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:RATE?

Returns: <discrete>

SDH Mapping Settings

:SOURce:DATA:TELecom:SDH:AUG64 <numeric>

<numeric> = 1 AUG-64 number.

Selects the transmitted AUG-64 that is selected for test.

Only valid if :SOURce:DATA:TELecom:SDH:RATE is set to a rate higher than STM-16.

The corresponding query returns the AUG-64 selected for test in numeric form, as listed above.

:SOURce:DATA:TELecom:SDH:AUG64?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:AUG16 <numeric>

<numeric> = 1 to 4 AUG-16 number.

Selects the transmitted AUG-16 that is selected for test.

Only valid if :SOURce:DATA:TELecom:SDH:RATE is set to a rate higher than STM-4.

The corresponding query returns the AUG-16 selected for test in numeric form, as listed above.

:SOURce:DATA:TELecom:SDH:AUG16?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:AUG4 <numeric>

<numeric> = 1 to 4 AUG-4 number.

Selects the transmitted AUG-4 that is selected for test.

Only valid if :SOURce:DATA:TELecom:SDH:RATE is set to a rate higher than STM-1.

The corresponding query returns the AUG-4 selected for test in numeric form, as listed above.

:SOURce:DATA:TELecom:SDH:AUG4?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:AUG1 <numeric>

<numeric> = 1 to 4 AUG-1 number.

Selects the transmitted AUG that is selected for test.

Only valid if :SOURce:DATA:TELecom:SDH:RATE is set to a rate higher than STM-0.

The corresponding query returns the AUG-1 selected for test in numeric form, as listed above.

:SOURce:DATA:TELecom:SDH:AUG1?

Returns: <numeric>

Tandem Connection Monitoring (TCM) - SDH Only

:SOURce:DATA:TELecom:SDH:TCM:HPATh <boolean>

<boolean> =	OFF	High-Order (HO) TCM Path Off
	ON	High-Order (HO) TCM Path On

Enables and Disables the High-Order Tandem Connection Path.

The corresponding query returns the Tandem Connection High-Order Path in discrete form as 0 or 1.

:SOURce:DATA:TELecom:SDH:TCM:HPATh?

Returns: <boolean>

:SOURce:DATA:TELecom:SDH:TCM:LPATh <boolean>

<boolean> =	OFF	Low-Order (LO) TCM Path Off
	ON	Low-Order (LO) TCM Path On

Enables and Disables the Low-Order Tandem Connection Path.

The corresponding query returns the Tandem Connection Low-Order Path in discrete form as 0 or 1.

:SOURce:DATA:TELecom:SDH:TCM:LPATh?

Returns: <boolean>

AU Layer Selection

:SOURce:DATA:TELecom:SDH:AU:TYPE <discrete>

<discrete> = AU4
AU3
AU4_4C
AU4_16C
AU4_64C

Selects the AU mapping into an STM-N frame.

The corresponding query returns the AU layer in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:AU:TYPE?

Returns: <discrete>

Payload Layer Selection

:SOURce:DATA:TELecom:SDH:PAYLoad <discrete>

<discrete> =	BULK	Bulk Filled
	M140	140 Mb/s
	M34	34 Mb/s
	ASM2	Asynchronous
	FLM2	2 Mb/s floating byte
	FLDS1	DS1 floating byte
	ASDS1	Asynchronous DS3
	DS3	DS3

This command controls the transmitter SDH payload for single payload cases.

The corresponding query returns the payload in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:PAYLoad?

Returns: <discrete>

TUG Channel

:SOURce:DATA:TELecom:SDH:TUG3 <numeric>

<numeric> =	1 to 3	TUG3 Number

Selects the SDH Transmitter active TUG3 within the foreground AU4.

The corresponding query returns the active TUG3 in numeric form.

:SOURce:DATA:TELecom:SDH:TUG3?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:TUG2 <numeric>

<numeric> = 1 to 7 TUG2 Number

Selects the SDH Transmitter active TUG2 within the selected TUG3 or AU3.

The corresponding query returns the active TUG2 in numeric form.

:SOURce:DATA:TELecom:SDH:TUG2?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:TU <numeric>

<numeric> =	1 to 3	Tributary Number for TU-12
	1 to 4	Tributary Number for TU-11

Selects the SDH Transmitter active TU within the selected TUG2.

The corresponding query returns the active tributary in numeric form.

:SOURce:DATA:TELecom:SDH:TU?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:PAYLoad:OFFSet <numeric> <suffix>

<numeric> =	-100.0 to +100.0	Parts per Million
	-0.000100 to +0.000100	% or Ratio
<suffix>	PPM	Parts Per Million

PCT Percentage

Sets the amount of payload frequency offset. If Ratio is chosen as the method of specifying offset, no suffix is required.

The corresponding query returns the offset in numeric form.

:SOURce:DATA:TELecom:SDH:PAYLoad:OFFSet?

Returns: <numeric> ppm

Background Settings

:SOURce:DATA:TELecom:SDH:AU:BACKground <discrete>

<discrete> =	UNEQuipped	Fixed at 00000000
	AS_FG	As Foreground

Selects the payload in the background (non test) AUs. The corresponding query returns the type of payload in the background AUs in discrete short form.

:SOURce:DATA:TELecom:SDH:AU:BACKground?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TU:BACKground:PAYLoad:PATTern <discrete>

<discrete> =	PRBS9	2^9-1
	PRBS15	2^{15}-1
	NUMBered	framed TU12 or TU11
	B1100	word 1100

Selects the background payload pattern for TUs within the foreground TUG3 or AU3.

The corresponding query returns the background payload pattern in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:TU:BACKground:PAYLoad:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:PRIMary:BACKground:PAYLoad:PATTern <discrete>

<discrete> =	PRBS9	2^9-1
	PRBS15	2^{15}-1

	NUMBered	framed TU12 or TU11
	B1100	word 1100

Selects the background payload pattern for TUs within the foreground TUG3 or AU3.

The corresponding query returns the background payload pattern in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:PRIMary:BACKground:PAYLoad:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TUG3:BACKground:PAYLoad:PATTern <numeric> <discrete>

<numeric> =	1 to 3	TUG3 to be configured
<discrete> =	TU11	TU-3 structure
	TU12	TU-12 structure
	USER	User Defined

Selects the structure in a background TUG3. This command is only valid if the selected TUG3 is not the current foreground..

The corresponding query returns the specified TUG3 background structure in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:TUG3:BACKground:PAYLoad:PATTern? <numeric>

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TUG3:BACKground:PAYLoad:PATTern :USER <numeric> <numeric>

<numeric> =	1 to 3	TUG3 to be configured
<numeric> =	0 to 256	8 bit pattern

Sets the User Pattern to be transmitted in the specified background TUG3. This command is only valid if the TUG3 selected is not the current foreground.

The 8-bit numeric value can be entered using #b for binary representation, #h for hexadecimal or just as a decimal number.

The corresponding query returns the specified TUG3 background word pattern.

:SOURce:DATA:TELecom:SDH:TUG3:BACKground:PAYLoad:PATTern :USER? <numeric>

Returns: <discrete>

SOURce subsystem - Transmitter SDH Overhead Set Up

Lists the settings for the commands associated with the TRANSMIT OVERHEAD SET UP display. The following commands are only available when an SDH transmit signal rate is active.

:SOURce:DATA:TELecom:SDH:OVERhead:DEFault

Sets all overhead bytes to their default value:

:SOURce:DATA:TELecom:SDH:OVERhead:DATA <numeric>, <numeric>, <discrete>, <numeric>

<numeric> =	1 to 64	STM-1 Number
<numeric> =	1 to 3	Column Number
<discrete> =	A1 | A2 | E1 | F1 | D1 | D2 | D3 | K1 | H1 | K2 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | S1 | M0 | M1 | E2 X11 | X12 | X13 | X21 | X22 | X23 | X31 | X32 | X33 | X41 | X42 | X43 | X51 | X52 | X53 | X61 | X62 | X63 | X71 | X72 | X73 | X81 | X82 | X83 | X91 | X92 | X93 |	
<numeric> =	0 to 255	Byte Value

Sets the value of the selected transmitter section overhead byte. The required byte is specified by 4 command parameters.

The first parameter, STM-1 Number, identifies an STM-1 within the signal. The acceptable range for this parameter will depend on the selected transmit signal rate. For the STM-0 signal rate only 1 is valid.

The second parameter identifies a set of columns within the selected STM-1. A Value of 1 selects columns 1,4 & 7, a value of 2 selects Columns 2,5 & 8, and a value of 3 selects Columns 3,6 & 9. For the STM-0 signal rate only 1 is valid.

The third parameter identifies the specific byte in the selected set of columns. There are two ways of specifying this byte. The first is to use standard names where these are valid. The set of valid names is shown in the table above. The second method is to use an "Xrc" notation, where r is the numerical value of the bytes row in the transport overhead and c is the numerical value of the bytes column in the transport overhead. This method allows access to ANY byte in the selected STM-1 / Column set.

The fourth command parameter is the new value that will be transmitted in the specified byte. This value can be specified in hex, octal or decimal format.

The corresponding query returns the value set of the byte named within the selected STM-1 column.

:SOURce:DATA:TELecom:SDH:OVERhead:DATA? <numeric>, <numeric>, <discrete>

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern <discrete>

<discrete> =	FIXed	Fixed Byte Sequence
	B16Crc	16 Byte Sequence (with CRC)
	B64	64 Byte Sequence

Sets the type of pattern that is to be transmitted in the J0 byte of the STM regenerator section overhead. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames. Default is FIXed.

The corresponding query returns the type of pattern being transmitted in overhead byte J0 in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern?

Returns: <discrete>

SOURce subsystem - Transmitter SDH Overhead Set Up

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:FIXed <numeric>

<numeric> = 0 to 255 Byte Value

Sets the fixed byte value of the J0 byte. Only relevant when :SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern is set to FIXed.

The corresponding query returns the fixed byte value of the J0 byte as a numeric.

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:FIXed?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:B16Crc <string>

Sets the 16-byte sequence of the J0 byte of the regenerator section overhead. The command parameter is a 15 character long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only available when :SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern is set to B16Crc.

The corresponding query returns the value of the J0 sequence as a 15-byte string. If the string contains any non-printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:B16Ccrc?

Returns: <string>

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:B64 <string>

Sets the 64-byte sequence of the J0 byte of the regenerator section overhead.

If the string is not 64 characters long the instrument will either append NULLS or truncate the string and terminate with a CR/LF to make it 64 characters long. The pattern repeats every 64 characters and is transmitted character by character in subsequent frames.

Only available when :SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern is set to B64.

The corresponding query returns the value of the 64-byte J0 sequence as a string. If the string contains any non-printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:B64?

Returns: <string>

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:ARRay?

Returns: <block>

Returns the J0 trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using :SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern .

:SOURce:DATA:TELecom:SDH:OVERhead:SBYTe <discrete>

<discrete> =	QUALunknown	(0000)
	G811	(0010)
	SSUA	(0100)
	SSUB	(1000)
	G813	(1011)
	DONTusesync	(1111)

Selects the SDH SYNC message type (S1 Byte Bits 5 to 8).

The corresponding query returns the Sync Message type in discrete form as listed above. If the SDH SYNC message type is not defined, then the query will return REServed.

:SOURce:DATA:TELecom:SDH:OVERhead:SBYTe?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:POVerhead:DATA <discrete>,<numeric>

<discrete>= C2 | G1 | F2 | H4 | F3 | K3 | N1

<numeric>= 0 to 255 Byte Value

Sets the value of the specified VC-4-64c, VC-4-16c, VC-4-4c, VC-4, VC-3 foreground high order path overhead byte.

The N1 byte can only be set when the command :SOURce:DATA:TELecom:SDH:TCM:HPATh is set to FALSE.

The corresponding query returns the byte specified in numeric form, as described above.

:SOURce:DATA:TELecom:SDH:POVerhead:DATA? <discrete>

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern <discrete>

<discrete> = B16Crc 16 Byte Sequence (with CRC)

B64 64 Byte Sequence

Sets the type of sequence to be transmitted within the J1 byte of the foreground high order path overhead.

The corresponding query returns the specified sequence type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern:B16Crc <string>

Sets the 16-byte sequence of the J1 byte of the foreground high order path overhead. The command parameter is a 15 characters long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only valid when :SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern is set to B16Crc.

The corresponding query returns the value of the J1 sequence as a 15-byte string. If the string contains any non printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern:B64 <string>

Sets the 64-byte sequence of the J1 byte of the foreground high order path overhead.

If the string is not 64 characters long the instrument will either append NULLS or truncate the string and terminate with a CR/LF to make it 64 characters long. The pattern repeats every 64 characters and is transmitted character by character in subsequent frames.

Only available when :SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern is set to B64.

The corresponding query returns the value of the 64-byte J1 sequence as a string. If the string contains any non-printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern:B64?

Returns: <string>

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern:ARRay?

Returns: <block>

Returns the high order J1 trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using :SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern.

:SOURce:DATA:TELecom:SDH:POVerhead:SLABel <discrete>

<discrete> =	UNEQuipped	Unequipped (00000000)
	EQUipped	Equipped (00000001)
	TUGStructure	TUG structure (00000010)
	LOCKed	Locked TU (00000011)
	ASYN34	Asynchronous 34 /45 Mb/s (00000100)
	ASYN140	Asynchronous 140 Mb/s (00010010)
	ATM	ATM (00010011)
	DQDB	DQDB (00010100)
	FDDI	FDDI (00010101)
	PPPScram	PPP Scrambling On (00010110)
	SDL1	SDL1 (00010111)
	LAPS	LAPS (00011000)

SDL2	SDL2 (00011001)
GBE10	10Gbs Ethernet (00011010)
PPPNoscram	PPP Scrambling Off (11001111)
BULK	Bulk Filled (11111110)
VCAis	VCAIS (11111111)

Sets the value of the path label (C2 Byte) of the foreground high order path overhead.

To set the byte to any value, use the :SOURce:DATA:TELecom:SDH:POVerhead:DATA command.

The corresponding query returns the value of the C2 byte in discrete short form. If the value of the signal label is not defined, the query will return REServed.

:SOURce:DATA:TELecom:SDH:POVerhead:SLABel?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TCM:APID:PATTern <discrete>

<discrete> = B16Crc 16 Byte Sequence (with CRC)

Sets the type of sequence to be transmitted within the N1 byte of the foreground high order path overhead.

Only valid when :SOURce:DATA:TELecom:SDH:TCM:HPATh is set to TRUE.

The corresponding query returns the specified sequence type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:TCM:APID:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TCM:APID:PATTern:B16Crc <string>

Sets the 16-byte sequence of the N1 byte of the foreground high order path overhead. The command parameter is a 15 characters long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only valid when :SOURce:DATA:TELecom:SDH:TCM:APID:PATTern is set to B16Crc, and :SOURce:DATA:TELecom:SDH:TCM:HPATh is set to TRUE.

The corresponding query returns the value of the N1 sequence as a 15-byte string. If the string contains any non printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SDH:TCM:APID:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SDH:TCM:APID:PATTern:ARRay?

Returns: <block>

Returns the high order TCM trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using :SOURce:DATA:TELecom:SDH:TCM:APID:PATTern.

:SOURce:DATA:TELecom:SDH:POVerhead:H4Sequence <discrete>

<discrete> =	LONG	Long Sequence
	SHORt	Short Sequence
	COC1	COC1 Sequence

Sets the H4 Path overhead byte sequence length when :SOURce:DATA:TELecom:SDH:TU is set to TU11 or TU12.

The corresponding query returns theH4 byte sequence length in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:POVerhead:H4Sequence?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:DATA <discrete> <numeric>

<discrete> = C2 | G1 | F2 | H4 | F3 | K3 | N1 | V5 | J2 | N2 | K4

<numeric> 0 to 255 Byte Value

Sets the value of the specified VC-3, VC-12 or VC-11 foreground low oreder path overhead byte to the value specified by <numeric>.

For V5, a bitmask of 00111111 is applied to the value of <numeric> since the BIP-2 cannot be set.

The corresponding query returns the byte specified in numeric form as described above.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:DATA? <discrete><

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern <discrete>

<discrete> = B16Crc 16 Byte Sequence (with CRC)
B64 64 Byte Sequence

Sets the type of sequence to be transmitted within the J1 byte of the foreground low order path overhead.

The corresponding query returns the specified sequence type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern:B16Crc <string>

Sets the 16-byte sequence of the J1 byte of the foreground low order path overhead. The command parameter is a 15 characters long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only valid when :SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern is set to B16Crc.

The corresponding query returns the value of the J1 sequence as a 15-byte string. If the string contains any non printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern:B64 <string>

Sets the 64-byte sequence of the J1 byte of the foreground low order path overhead.

If the string is not 64 characters long the instrument will either append NULLS or truncate the string and terminate with a CR/LF to make it 64 characters long.

The pattern repeats every 64 characters and is transmitted character by character in subsequent frames.

Only available when :SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern is set to B64.

The corresponding query returns the value of the 64-byte J1 sequence as a string. If the string contains any non-printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern:B64?

Returns: <string>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern:ARRay?

Returns: <block>

Returns the high order J1 trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using :SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:C2:SLABel <discrete>

<discrete> =		
	UNEQuipped	Unequipped (00000000)
	EQUipped	Equipped (00000001)
	TUGStructure	TUG structure (00000010)
	LOCKed	Locked TU (00000011)
	ASYN34	Asynchronous 34 /45 Mb/s (00000100)
	ASYN140	Asynchronous 140 Mb/s (00010010)
	ATM	ATM (00010011)
	DQDB	DQDB (00010100)
	FDDI	FDDI (00010101)
	PPPScram	PPP Scrambling On (00010110)

SDL1	SDL1 (00010111)
LAPS	LAPS (00011000)
SDL2	SDL2 (00011001)
GBE10	10Gbs Ethernet (00011010)
PPPNoscram	PPP Scrambling Off (11001111)
BULK	Bulk Filled (11111110)
VCAis	VCAIS (11111111)

Sets the value of the path label (C2 Byte) of the foreground low order path overhead.

To set the byte to any value, use the :SOURce:DATA:TELecom:SDH:TU:POVerhead:DATA command.

The corresponding query returns the value of the C2 byte in discrete short form. If the value of the signal label is not defined, the query will return REServed.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:C2:SLABel?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:V5:SLABel <discrete>

<numeric> = 0 to 7

Sets the value of the signal label (V5 Byte) of the foreground low order path overhead.

The corresponding query returns the value of the V5 byte in numeric form.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:V5:SLABel?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J2:PATTern <discrete>

<discrete> =	FIXed	Fixed Byte Value
	B16Crc	16 Byte Sequence (with CRC)

Sets the type of sequence to be transmitted within the J2 byte of the foreground low order path overhead.

The corresponding query returns the specified sequence type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J2:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:POVERhead:J2:PATTern:FIXed <numeric>

<numeric> =	0 to 255	Byte Value

Sets the fixed byte value of the J0 byte. Only relevant when :SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern is set to FIXed.

The corresponding query returns the fixed byte value of the J0 byte as a numeric.

:SOURce:DATA:TELecom:SDH:POVERhead:J2:PATTern:FIXed?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J2:PATTern:B16Crc <string>

Sets the 16-byte sequence of the J2 byte of the foreground low order path overhead. The command parameter is a 15 characters long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make

it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only valid when :SOURce:DATA:TELecom:SDH:TU:POVerhead:J2:PATTern is set to B16Crc.

The corresponding query returns the value of the J2 sequence as a 15-byte string. If the string contains any non printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J2:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J2:PATTern:ARRay?

Returns: <block>

Returns the high order J2 trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using :SOURce:DATA:TELecom:SDH:TU:POVerhead:J2:PATTern.

:SOURce:DATA:TELecom:SDH:TU:TCM:N1:APID:PATTern <discrete>

<discrete> = B16Crc 16 Byte Sequence (with CRC)

Sets the type of sequence to be transmitted within the N1 byte of the foreground low order path overhead.

Only valid when :SOURce:DATA:TELecom:SDH:TCM:LPATh is set to TRUE.

The corresponding query returns the specified sequence type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:TU:TCM:N1:APID:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TU:TCM:N1:APID:PATTern:B16Crc <string>

Sets the 16-byte sequence of the N1 byte of the foreground low order path overhead. The command parameter is a 15 characters long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only valid when :SOURce:DATA:TELecom:SDH:TU:TCM:N1:APID:PATTern is set to B16Crc, and :SOURce:DATA:TELecom:SDH:TCM:LPATh is set to TRUE.

The corresponding query returns the value of the N1 sequence as a 15-byte string. If the string contains any non printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SDH:TU:TCM:N1:APID:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SDH:TU:TCM:N1:APID:PATTern:ARRay?

Returns: <block>

Returns the high order TCM trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using :SOURce:DATA:TELecom:SDH:TU:TCM:N1:APID:PATTern.

:SOURce:DATA:TELecom:SDH:TU:TCM:N2:APID:PATTern <discrete>

<discrete> = B16Crc 16 Byte Sequence (with CRC)

Sets the type of sequence to be transmitted within the N2 byte of the foreground low order path overhead.

Only valid when :SOURce:DATA:TELecom:SDH:TCM:LPATh is set to TRUE.

The corresponding query returns the specified sequence type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:TU:TCM:N2:APID:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TU:TCM:N2:APID:PATTern:B16Crc <string>

Sets the 16-byte sequence of the N2 byte of the foreground low order path overhead. The command parameter is a 15 characters long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only valid when :SOURce:DATA:TELecom:SDH:TU:TCM:N2:APID:PATTern is set to B16Crc, and :SOURce:DATA:TELecom:SDH:TCM:LPATh is set to TRUE.

The corresponding query returns the value of the N2 sequence as a 15-byte string. If the string contains any non printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SDH:TU:TCM:N2:APID:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SDH:TU:TCM:N2:APID:PATTern:ARRay?

Returns: <block>

Returns the high order TCM trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using :SOURce:DATA:TELecom:SDH:TU:TCM:N2:APID:PATTern.

Overhead Sequences Commands

:SOURce:DATA:TELecom:SDH:SEQuence:CHANnel:SELect <numeric>

<numeric> = 1 to 64 AU number

Selects the STM-1 Channel from which the overhead sequence will be generated.

The corresponding query returns the STM1 channel number currently selected, in numeric form.

:SOURce:DATA:TELecom:SDH:SEQuence:CHANnel:SELect?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:SEQuence:OHBYte <discrete>

<discrete> = A1A2 | BNDA1A2 | E1 | F1 | D1D3 | K1K2 | H1 | D4D12 | S1 | M0 | M1 | J1 | E2 | C2 | G1 | F2 | H4 | F3 | K3 | N1 | H1H2_1 | H1H2_2 | H1H2_3 | H3_1 | H3_2 | H3_3 Xrc

Selects the overhead channel to be used to transmit a sequence. "A1A2" selects Channel Associated A1A2 while "BNDA1A2" selects A1A2 Boundary.

A byte/channel may also be selected by using an 'Xrc' notation where 'r' specifies the row of the required byte and 'c' specifies the column. For example, specifying 'X24' will select the 4th byte on the 2nd row of the specified STM-1 structure.

The corresponding query returns the selected overhead capture channel in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:SEQuence:OHBYte?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:SEQuence:DEFault

Restores all sequence variables to their default values.

:SOURce:DATA:TELecom:SDH:SEQuence:INCRement

Resets the sequence repeat counts and data values and inserts incrementing values.

:SOURce:DATA:TELecom:SDH:SEQuence:FCOunt <numeric>,<numeric>

<numeric> =	1 to 256	Sequence Element Index
<numeric> =	0 to 65535	Sequence Element Repeat Count

For the selected sequence element specifies the number of frames in which the element data is to be transmitted.

The corresponding query returns the frame count for the specified sequence element.

:SOURce:DATA:TELecom:SDH:SEQuence:FCOunt? <numeric>

Returns: <numeric> Frame count

:SOURce:DATA:TELecom:SDH:SEQuence:DATA <numeric>,<string>

<numeric> =	1 to 256	Element Index
<string>	See Below	Element Data

Sets the sequence data pattern for the designated element to the hexadecimal value contained in the string. The number of hexadecimal characters is dependent on the overhead channel selected by :SOURce:DATA:TELecom:SDH:SEQuence:OHBYte.

Two hexadecimal characters are required per byte, for example:

TCMACT - 1 byte "00" to "FF"

FAS - 6 bytes "000000000000" to "FFFFFFFFFFFF"

The corresponding query returns the data for the specified sequence element in string form.

:SOURce:DATA:TELecom:SDH:SEQuence:DATA? <numeric>

<numeric> = 1 to 256

Returns: <string>

:SOURce:DATA:TELecom:SDH:SEQuence:MODE <discrete>

<discrete> =	SINGle	Single Run
	REPeat	Repeat Run

Selects whether to run a sequence once or repeatedly.

The corresponding query returns the type of sequence in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:SEQuence:MODE?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:SEQuence <discrete>

<discrete> =	STOP	Stop current sequence
	STARt	Start new sequence

Stops or starts a Single or Repeat run Sequence.

The corresponding query returns the Sequence status in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:SEQuence?

Returns: <discrete>

SOURce subsystem - Transmitter Error Test Functions

:SOURce:DATA:TELecom:SDH:ERRor:GROup <discrete>

<discrete> =	PHYSical	Physical Errors
	SECTion	SDH Section Errors
	PATH	SDH Path Errors
	HP TCM	SDH High Order PathTandem Connection Monitor Errors
	LP TCM	SDH Low Order Path Tandem Connection Monitor Errors
	PATTern	Pattern Errors

Selects SDH transmit test function Error Group. Further selection of :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete> is required. Selection of PATTern results in BIT error type being selected.

The corresponding query returns the Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ERRor:GROup?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ERRor:PHYSical <discrete>

<discrete> =	EFRame	Entire Frame or data errors

Selects Physical Error Type to generate. Further selection of :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete> is required.

The corresponding query returns the Physical Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ERRor:PHYSical?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ERRor:SECTion <discrete>

<discrete> =	FRAMe	A1A2 Frame Errors
	RSBip	RS-BIP, B1 Errors
	MSBip	MS-BIP, B2 Errors
	MSRei	MS-REI Errors

Selects Section Error Type to generate. Further selection of :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete> is required.

The corresponding query returns the Section Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ERRor:SECTion?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ERRor:PATH <discrete>

<discrete> =	PBIP	Path Bip, B3 Errors
	HPRei	HP-REI Errors
	LPRei	LP-REI Errors
	LPBip	LP-BIP Errors

Selects Path Error Type to generate. Further selection of :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete> is required.

The corresponding query returns the Path Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ERRor:PATH?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ERRor:TCM <discrete>

<discrete> =	TCIec	TCM Incoming Error Count
	TCRei	TCM REI
	OEI	TCM Outgoing Error Indication

Selects TCM High Order Path Error Type to generate. Further selection of :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete> is required.

The corresponding query returns the TCM Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ERRor:TCM?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ERRor:LPATh:TCM <discrete>

<discrete> =	TCIec	TCM Incoming Error Count
	TCRei	TCM REI
	OEI	TCM Outgoing Error Indication

Selects TCM Low Order Path Error Type to generate. Further selection of :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete> is required.

The corresponding query returns the TCM Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ERRor:LPATh:TCM?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ERRor:PDH <discrete>

<discrete> = BIT

Selects PDH Error Type to generate. Further selection of :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete> is required.

The corresponding query returns the PDH Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ERRor:PDH?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ERRor:DSN <discrete>

<discrete> = BIT

Selects DSN Error Type to generate. Further selection of :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete> is required.

The corresponding query returns the DSN Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ERRor:DSN?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ERRor:PATTern <discrete>

<discrete> = BIT

Selects Pattern Error Type to generate. Further selection of :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete> is required.

The corresponding query returns the Pattern Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ERRor:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:ERRor:SINGle

Injects a single error.

There is no corresponding query.

:SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete>

<discrete> =	NONE	Errors Off
	EALL	Error All
	APSThreshold	APS Threshold (MS Bit only)
	E_3	Line rate dependent
	E_4	Line rate dependent
	E_5	Line rate dependent
	E_6	
	E_7	
	E_8	
	E_9	
	USER	User defined error rate

Selects the transmitter Error Rate of the error type (with the exception of EFRame and FRAMe selections) selected by the Error Group Selection Functons.

The corresponding query returns the selected transmitter Error Rate in discrete form, as listed above.

Note — If this query returns USER, then :SOURce:DATA:TELecom:SDH:ERRor:RATE:USER? must be used to discover the currently injected error rate.

:SOURce:DATA:TELecom:SDH:ERRor:RATE?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ERRor:RATE:USER <numeric>

<numeric>=	9.9E-9 to 1.1E-3	mantissa resolution 0.1, exponent resolution 1

Sets the user defined Error Add rate.
:SOURce:DATA:TELecom:SDH:ERRor:RATE must be set to USER

Note	The maximum user defined error rate is dependent on both error type and line rate.

The corresponding query returns the User Error Rate as a numeric.

:SOURce:DATA:TELecom:SDH:ERRor:RATE:USER?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:ERRorRATE:USER:ACTion <boolean>

<boolean>= OFF
ON User Value set as Error Rate

Sets the user defined Error Add rate specified by :SOURce:DATA:TELecom:SDH:ERRor:RATE:USER .The corresponding query returns the boolean state of the User Rate.

:SOURce:DATA:TELecom:SDH:ERRor:RATE:USER:ACTion?

Returns: <boolean>

:SOURce:DATA:TELecom:SDH:ERRor:RATE:FRAMe <discrete>

<discrete> =		
	NONE	Errors Off
	ONE	1 in 4
	TWO	2 in 4
	THRee	3 in 4
	FOUR	4 in 4

Selects the transmitter Frame Error Rates of the error type EFRame and FRAMe selected
:SOURce:DATA:TELecom:SDH:ERRor:SECTion .

The corresponding query returns the selected transmitter Frame Error Rate in discrete form, as listed above.

:SOURce:DATA:TELecom:SDH:ERRor:RATE:FRAMe?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ERRor:APSThreshold:NERRors <numeric>

<numeric> =	0 to 640	for STM-0
	0 to 1920	for STM-1
	0 to 7680	for STM-4
	0 to 30720	for STM-16
	0 to 122880	for STM-64

Sets the number of errors for the APS Threshold when :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete>is set to APSThreshold. Default = 0.

The corresponding query returns the number of errors selected for the APS Threshold in numeric form.

:SOURce:DATA:TELecom:SDH:ERRor:APSThreshold:NERRors?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:ERRor:APSThreshold:EINTerval <discrete>

<discrete> =		
	MS10	10 milliseconds
	MS100	100 milliseconds
	S1	1 second
	S10	10 seconds
	S100	100 seconds
	S1000	1,000 seconds
	S10000	10,000 seconds

Sets the interval between APS Threshold errors when :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete>is set to APSThreshold .

The corresponding query returns the APS Threshold error interval in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ERRor:APSThreshold:EINTerval?

Returns: <discrete>

SOURce subsystem - Transmitter Alarm Test Functions

:SOURce:DATA:TELecom:SDH:ALARm:GROup <discrete>

<discrete> =	PHYSical	Physical Alarms
	SECTion	Section Alarms
	PATH	Path Alarms
	TCM	Tandem Connection Mode Alarms

Selects Alarm Group. Further selections from the group alarms must be made using
:SOURce:DATA:TELecom:SDH:ALARm:PHYSical,
:SOURce:DATA:TELecom:SDH:ALARm:SECTion ,
:SOURce:DATA:TELecom:SDH:ALARm:PATH …etc, and finally
:SOURce:DATA:TELecom:ALARm should be set to ON to activate the alarm selected.

The corresponding query returns the Alarm Group selected in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ALARm:GROup?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ALARm:PHYSical <discrete>

<discrete> =	LOS	Loss of Signal Alarm

Selects PHYSical Alarms.

The corresponding query returns the PHYSical Alarm selected in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ALARm:PHYSical?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ALARm:SECTion <discrete>

<discrete> =	LOF	Loss of Frame
	OOF	Out of Frame
	MSAis	MS-AIS alarm indication signal
	MSRDi	MS-RDI remote defect indication

Selects Section Alarms.

The corresponding query returns the Section Alarm selected in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ALARm:SECTion?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ALARm:OOF

Sets the OOF alarm Active.There is no corresponding query

:SOURce:DATA:TELecom:SDH:ALARm:PATH <discrete>

<discrete> =	PAIS	Path AIS
	AULop	AU-LOP Loss of AU pointer
	HPRDi	HP-RDI remote defect indication
	PUNequipped	Path Unequipped

Selects Path Alarms.

The corresponding query returns the Path Alarm selected in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ALARm:PATH?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ALARm:TCM <discrete>

<discrete> =	TCRDi	TCM remote defect indication
	ODI	outgoing defect indication
	TCOom	TCM loss of multi-frame alignment
	IAIS	Incoming alarm indication signal
	VCAis	VC alarm indication signal
	TCUNequipped	TCM unequiped

Selects Tandem Connection Mode Alarms.

The corresponding query returns the TCM Alarm selected in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ALARm:TCM?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ALARm:LERDI <discrete>

<discrete> =	OFF	LO Path RDI no defect, non-enhanced
	PAYLoad	LO Path RDI payload enhanced
	SERVer	LO Path RDI server defect enhanced
	CONNection	LO Path RDI connection enhanced

Selects LO Path Enhanced RDI Alarm state.

The corresponding query returns the LO Path Enhanced RDI Alarm state selected in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ALARm:LERDI?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ALARm:HERDI <discrete>

<discrete> =	OFF	HI Path RDI no defect, non-enhanced
	PAYLoad	HI Path RDI payload enhanced
	SERVer	HI Path RDI server defect enhanced
	CONNection	HI Path RDI connection enhanced

Selects HI Path Enhanced RDI Alarm state.

The corresponding query returns the HI Path Enhanced RDI Alarm state selected in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ALARm:HERDI?

Returns: <discrete>

:SOURce:DATA:TELecom:ALARm <boolean>

<boolean> =	0 or OFF
	1 or ON

Enables and disables Alarm Generation.

The corresponding query returns the Alarm Generation state as 0 or 1.

:SOURce:DATA:TELecom:ALARm?

Returns: <boolean>

SOURce subsystem - Pointer Adjust Test Functions

:SOURce:DATA:TELecom:SDH:POINter <discrete>

<discrete> =	BURSt	Pointer Burst
	NPOinter	New Pointer Value
	OFFSet	Pointer Offset

Selects the Pointer Test Function.

The corresponding query returns the Pointer Test Function selected in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:POINter?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:POINter:TYPE <discrete>

<discrete> =	AU	AU Pointer
	TU	TU Pointer

Selects the Pointer Type.

The corresponding query returns the Pointer Type selected in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:POINter:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:POINter:BURSt:ACTion

Forces the pointer value to change according to the burst size and direction set using the following commands
:SOURce:DATA:TELecom:SDH:POINter:BURSt:DIRection and
:SOURce:DATA:TELecom:SDH:POINter:BURSt:SIZE

To use this function the command
:SOURce:DATA:TELecom:SDH:POINter should be set to BURSt.

There is no corresponding query.

:SOURce:DATA:TELecom:SDH:POINter:BURSt:DIRection <discrete>

<discrete> =	INCRement	Increment Pointer Value
	DECRement	Decrement Pointer Value
	ALTernate	Burst placed in opposite direction to last burst

Selects the Pointer Burst Direction.

The corresponding query returns the Pointer Burst Direction selected in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:POINter:BURSt:DIRection?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:POINter:BURSt:SIZE <numeric>

<numeric> = 1 to 10

Selects the Pointer Burst Size.

The corresponding query returns the Pointer Burst Size set.

:SOURce:DATA:TELecom:SDH:POINter:BURSt:SIZE?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:POINter:NEW:ACTion

Forces the pointer value to adopt the New Pointer value and new flag status, set using the following commands :SOURce:DATA:TELecom:SDH:POINter:NEW:VALue and :SOURce:DATA:TELecom:SDH:POINter:NEW:FLAG.

To use this function the command :SOURce:DATA:TELecom:SDH:POINter should be set to NEW.

There is no corresponding query.

:SOURce:DATA:TELecom:SDH:POINter:NEW:VALue <numeric>

<numeric> = 0 to 782

Selects the New Pointer Value.

The corresponding query returns the New Pointer Value set, in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:POINter:NEW:VALue?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:POINter:NEW:FLAG <discrete>

<discrete> =	NNDF	No New Data Flag
	NDF	New Data Flag

Selects whether a New Pointer Data Flag is generated.

The corresponding query returns the New Pointer Flag set, in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:POINter:NEW:FLAG?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:POINter:OFFSet:ACTion <boolean>

<boolean> =	0 or OFF
	1 or ON

Enables and Disables the Pointer Offset Test Function. The type of Offset and offset rate are set using the following commands:

:SOURce:DATA:TELecom:SDH:POINter:OFFSet and
:SOURce:DATA:TELecom:SDH:POINter:OFFSet:RATE

To use this function the command
:SOURce:DATA:TELecom:SDH:POINter should be set to OFFSet and :SOURce:CLOCk:FOFFset:ACTive should be set to OFF.

The corresponding query returns the Pointer Offset Test Function active state as 0 or 1.

:SOURce:DATA:TELecom:SDH:POINter:OFFSet:ACTion?

Returns: <boolean>

:SOURce:DATA:TELecom:SDH:POINter:OFFSet <discrete>

<discrete> =	SIGNal	Signal offset
	PAYLoad	Payload Offset

Selects the Pointer Offset Type.

The corresponding query returns the Pointer Offset Type selected, in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:POINter:OFFSet?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:POINter:OFFSet:RATE <numeric>

<numeric> =	-100.0 to +100.0	parts per million

Selects the Pointer Offset Rate.

The corresponding query returns the Pointer Offset Rate set.

:SOURce:DATA:TELecom:SDH:POINter:OFFSet:RATE?

Returns: <numeric>

SOURce subsystem - Frequency Offset Test Functions

:SOURce:CLOCk:SDH:FOFFset <boolean>

<boolean> = 0 or OFF
1 or ON

Enables or disables the Clock Frequency Offset. The amount of Offset is set using :SOURce:CLOCk:SDH:FOFFset:OFFSet <numeric>.

The corresponding query returns the Clock Frequency Offset active state as 0 or 1.

:SOURce:CLOCk:SDH:FOFFset?

Returns: <boolean>

:SOURce:CLOCk:SDH:FOFFset:OFFSet <numeric>

<numeric> = -999.00 to +999.00 ppm for 2.5Gb/s..52Mb/s
-999.00 to +999.00 ppm for 10Gb/s and PDH rates

Sets the amount of Clock Frequency Offset when Frequency Offset is enabled by setting :SOURce:CLOCk:SDH:FOFFset <boolean> to ON.

The corresponding query returns the amount of Clock Frequency Offset in parts per million.

:SOURce:CLOCk:SDH:FOFFset:OFFSet?

Returns: <numeric>

SOURce subsystem - APS Messages

:SOURce:DATA:TELecom:SDH:APSMessages:TOPology <discrete>

<discrete> =	LINear	Linear protection
	RING	Ring protection

Selects the type of protection topology.

The corresponding query returns the selected protection topology in discrete short form.

:SOURce:DATA:TELecom:SDH:APSMessages:TOPology?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:APSMessages:REQuest <discrete>

<discrete> =	NREQuest	No Request (0000)
	DNRevert	Do Not Revert (0001)
	RREQuest	Reverse Request (0010)
	THRee	Not Used (0011)
	EXERcise	Exercise (0100)
	FIVE	Not Used (0101)
	LWTRestore	Wait To Restore (0110)
	SEVen	Not Used (0111)
	MSWitch	Manual Switch (1000)
	NINE	Not Used (1001)
	SDLPriority	Signal Degrade Low Priority (1010)
	SDHPriority	Signal Degrade High Priority (1011)
	SFLPriority	Signal Fair Low Priority (1100)
	SFHPriority	Signal Fair High Priority (1101)

FSWitch	Forced Switch (1110)
LOPRotection	Lockout Of Protection (1111)

Selects the transmitter SDH APS message to be transmitted (K1 Byte, Bits 1 to 4). Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology is set to LIN.

SDHP and SFHP are only valid when :SOURce:DATA:TELecom:SDH:APSMessages:ARCHitecture is set to SDH.

The corresponding query returns the selected transmitter SDH APS message type in discrete form, as listed above.

:SOURce:DATA:TELecom:SDH:APSMessages:REQuest?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:APSMessages:CHANnel <numeric>

<numeric> =	0	NULL Channel
	1	Working Channel 1
	2	Working Channel 2
	3	Working Channel 3
	4	Working Channel 4
	5	Working Channel 5
	6	Working Channel 6
	7	Working Channel 7
	8	Working Channel 8
	9	Working Channel 9
	10	Working Channel 10
	11	Working Channel 11
	12	Working Channel 12
	13	Working Channel 13
	14	Working Channel 14
	15	Extra Traffic Channel

Selects the transmitter SDH APS message channel (K1 Byte, Bits 5 to 8).

Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology is set to LIN.

Working Channel 2 to 14 extra traffic channels are only valid if :SOURce:DATA:TELecom:SDH:APSMessages:ARCHitecture is set to SDH.

The corresponding query returns the selected transmitter SDH APS message channel in numeric form.

:SOURce:DATA:TELecom:SDH:APSMessages:CHANnel?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:APSMessages:BRIDge <numeric>

<numeric> = 0 to 15

Selects the SDH transmitter Linear APS message bridged channel (K2 Byte, Bits 1 to 4). Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology is set to LIN.

The corresponding query returns the APS messages bridged channel as a numeric.

:SOURce:DATA:TELecom:SDH:APSMessages:BRIDge?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:APSMessages:ARCHitecture <discrete>

<discrete> =	OTONe	1+1
	SDH	1:N

Selects the SDH transmitter Linear APS architecture (K2 Byte, Bit 5). Only valid if

:SOURce:DATA:TELecom:SDH:APSMessages:TOPology is set to LIN.

The corresponding query returns the selected transmitter SDH APS message architecture in discrete form, as listed above.

:SOURce:DATA:TELecom:SDH:APSMessages:ARCHitecture?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:APSMessages:REServed <numeric>

<numeric> =		
	0	000
	1	001
	2	010
	3	011
	4	100
	5	101

Selects the SDH transmitter Linear APS messages reserved bits (K2 Byte, Bits 6 to 8) in numeric form. Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology is set to LIN.

The corresponding query returns the selected transmitter SDH APS message reserved bits in numeric form.

:SOURce:DATA:TELecom:SDH:APSMessages:REServed?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:APSMessages:RCODe <discrete>

<discrete> =		
	NREQuest	No Request (0000)
	RRRing	Reverse Request - Ring (0001)
	RRSPan	Reverse Request - Stan (0010)
	ERINg	Exerciser - Ring (0011)
	ESPan	Exerciser - Stan (0100)

RWTRestore	Wait to Restore (0101)
MSRing	Manual Switch - Ring (0110)
MSSPan	Manual Switch - Stan (0111)
SDRing	Signal Degrade - Ring (1000)
SDSPan	Signal Degrade - Stan (1001)
SDPRotection	Signal Degrade - Protection (1010)
SFRing	Signal Fair - Ring (1011)
SFSPan	Signal Fair - Stan (1100)
FSRing	Forced Switch Ring (1101)
FSSPan	Forced Switch - Stan(1110)
LOPRotection	Lockout Of Protection (1111)

Selects the transmitter Ring APS message to be transmitted (K1 Byte, Bits 1 to 4). Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology is set to RING.

The corresponding query returns the selected transmitter SDH APS message type in discrete short form.

:SOURce:DATA:TELecom:SDH:APSMessages:RCODe?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:APSMessages:DNODe <numeric>

<numeric> = 0 to 15

Selects the SDH transmitter Ring APS message destination node (K1 Byte, Bits 5 to 8). Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology is set to RING.

The corresponding query returns the APS messages destination node as a numeric.

:SOURce:DATA:TELecom:SDH:APSMessages:DNODe?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:APSMessages:SNODe <numeric>

<numeric> = 0 to 15

Selects the SDH transmitter Ring APS message source node (K2 Byte, Bits 1 to 4) . Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology is set to RING.

The corresponding query returns the APS messages source node as a numeric .

:SOURce:DATA:TELecom:SDH:APSMessages:SNODe?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:APSMessages:PCODe <discrete>

<discrete> =	SHORt	Short path
	LONG	Long path

Selects the SDH transmitter Ring APS message path type (K2 bit 5). Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology is set to RING.

The corresponding query returns the Ring APS messages path type in discrete short form.

:SOURce:DATA:TELecom:SDH:APSMessages:PCODe?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:APSMessages:SCODe <numeric>

<numeric> =	0	Idle (000)
	1	Bridged (001)
	2	Bridged & Switched (010)
	3	011

4	100
5	101

Selects the SDH transmitter Ring APS messages status code (K2 Byte, Bits 6 to 8). Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology is set to RING.

The corresponding query returns the selected transmitter SDH APS message status code as a numeric.

:SOURce:DATA:TELecom:SDH:APSMessages:SCODe?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:APSMessages:DOWNload

Start transmission of the SDH transmitter APS message.

SOURce subsystem - DCC Insertion

:SOURce:DATA:TELecom:SDH:IDCC <discrete>

<discrete> =	NONE	Turns both Off
	RDCC	Regenerator DCC
	MDCC	Multiplexer DCC

Selects the Data Communication Channel Insert port for DCC Test functions.

The corresponding query returns the selected port in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:IDCC?

Returns: <discrete>

SENSe subsystem - Receiver SDH Settings

:SENSe:DATA:TELecom:SDH:RATE <discrete>

<discrete> =	STM64	10Gb/s
	STM16	2.5Gb/s
	STM4	622Mb/s
	STM1	155Mb/s
	STM0	51Mb/s

Sets the input rate for the instrument input port.

The corresponding query returns the rate selected in discrete form as listed above.

:SENSe:DATA:TELecom:SDH:RATE?

Returns: <discrete>

SDH Mapping settings

:SENSe:DATA:TELecom:SDH:AUG64 <numeric>

<numeric> =	1	AUG-64 number

Selects the received AUG-64 that is selected for test.

Only valid if :SENSe:DATA:TELecom:SDH:RATE is set a rate higher then STM16.

The corresponding query returns the AUG-64 selected for test in numeric form, as listed above.

:SENSe:DATA:TELecom:SDH:AUG64?

Returns: <numeric>

:SENSe:DATA:TELecom:SDH:AUG16 <numeric>

<numeric> = 1 to 4 AUG-16 number

Selects the received AUG-64 that is selected for test.

Only valid if :SENSe:DATA:TELecom:SDH:RATE is set a rate higher then STM4.

The corresponding query returns the AUG-16 selected for test in numeric form, as listed above.

:SENSe:DATA:TELecom:SDH:AUG16?

Returns: <numeric>

:SENSe:DATA:TELecom:SDH:AUG4 <numeric>

<numeric> = 1 to 4 AUG-4 number

Selects the received AUG-4 that is selected for test.

Only valid if :SENSe:DATA:TELecom:SDH:RATE is set a rate higher then STM1.

The corresponding query returns the AUG-4 selected for test in numeric form, as listed above.

:SENSe:DATA:TELecom:SDH:AUG4?

Returns: <numeric>

:SENSe:DATA:TELecom:SDH:AUG1 <numeric>

<numeric> = 1 to 4 AUG-1 number

Selects the received AUG-1 that is selected for test.

Only valid if :SENSe:DATA:TELecom:SDH:RATE is set a rate higher then STM0.

The corresponding query returns the AUG-1 selected for test in numeric form, as listed above.

:SENSe:DATA:TELecom:SDH:AUG1?

Returns: <numeric>

Tandem Connection Monitoring (TCM) - SDH Only

:SENSe:DATA:TELecom:SDH:TCM:HPATh <boolean>

<boolean> =	OFF	High-Order (HO) TCM Path Off
	ON	High-Order (HO) TCM Path On

Enables and Disables the High-Order Tandem Connection Path.

The corresponding query returns the Tandem Connection High-Order Path in discrete form as 0 or 1.

:SENSe:DATA:TELecom:SDH:TCM:HPATh?

Returns: <boolean>

AU Layer Selection

:SENSe:DATA:TELecom:SDH:AU:TYPE <discrete>

<discrete> =	AU4	
	AU3	
	AU4_4C	
	AU4_16C	
	AU4_64C	

Set the AU Mapping into an STM-N frame.

The corresponding query returns the AU type in discrete form as listed above.

:SENSe:DATA:TELecom:SDH:AU:TYPE?

Returns: <discrete>

Payload Layer Selection

:SENSe:DATA:TELecom:SDH:PAYLoad <discrete>

<discrete> =	BULK	Bulk Filled
	M140	140 Mb/s
	M34	34 Mb/s
	ASM2	Asynchronous
	FLM2	2 Mb/s floating byte
	FLDS1	DS1 floating byte
	ASDS1	Asynchronous DS3
	DS3	DS3

This command controls the receiver SDH payload for single payload cases.

The corresponding query returns the row payload in discrete form as listed above.

:SENSe:DATA:TELecom:SDH:PAYLoad?

Returns: <discrete>

TUG Channel

:SENSe:DATA:TELecom:SDH:TUG3 <numeric>

<numeric> = 1 to 3

Selects the SDH Receiver active TUG3 within the foreground AU4.

The corresponding query returns the active TUG-3 in numeric form.

:SENSe:DATA:TELecom:SDH:TUG3?

Returns: <numeric>

:SENSe:DATA:TELecom:SDH:TUG2 <numeric>

<numeric> = 1 to 7

Selects the SDH Receiver active TUG2 within the selected TUG3 or AU3.

The corresponding query returns the TUG2 in numeric form.

:SENSe:DATA:TELecom:SDH:TUG2?

Returns: <numeric>

:SENSe:DATA:TELecom:SDH:TU <numeric>

<numeric> =	1 to 3	Tributary Number for TU-12
	1 to 4	Tributary Number for TU-11

Selects the SDH Transmitter active TU within the selected TUG2.

The corresponding query returns the active tributary in numeric form.

:SENSe:DATA:TELecom:SDH:TU?

Returns: <numeric>

SENSe subsystem - Receiver SDH Test Function Commands

:SENSe:DATA:TELecom:SDH:OVERhead:CHANnel <numeric>

<numeric> =	1 to 64	AU number

Selects the STM-1 Channel from which the overhead bytes will be captured.

The corresponding query returns the STM1 channel number currently selected, in numeric form.

:SENSe:DATA:TELecom:SDH:OVERhead:CHANnel?

Returns: <numeric>

SENSe:DATA:TELecom:SDH:DDCC <discrete>

<discrete> =	NONE	Turns both Off
	RDCC	Regenerator Section DCC
	MDCC	Multiplexer Section DCC

Selects the Data Communications channel to be dropped via the DROP port, for DCC test function.

The corresponding query returns the selected DCC, in discrete form as listed above.

:SENSe:DATA:TELecom:SDH:DDCC?

Returns: <discrete>

SENSe subsystem - Data Capture Commands

The following commands are used to configure data capture for SDH. General commands for data capture are found in the Common Commands chapter.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:SDH:SECTion <discrete>

<discrete> =	FRAMe	A1A2 Error
	RSBip	RS BIP (B1) Error
	MSBip	MS BIP (B2) Error
	MSRei	MS REI Error

Selects SDH Section Overhead error for triggering data capture.

The corresponding query returns the selected SDH SOH error in discrete form listed above.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:SDH:SECTion?

Returns: <discrete>

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:SDH:PATH <discrete>

<discrete> =	PBIP	Path BIP (B3) Error
	HPRei	HP REI Error
	TCIec	TCM IEC Error
	TCRei	TCM REI Error
	OEI	TCM OEI Error

Selects SDH Path Overhead error for triggering data capture.

TCM errors are only valid when the appropriate SDH Tandem Connection Monitoring functionality is enabled.

The corresponding query returns the selected SDH POH error in discrete form listed above.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:SDH:PATH?

Returns: <discrete>

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:SDH:SECTion <discrete>

<discrete> =	LOF	Loss of Frame
	OOF	Out of Frame
	MSAis	MS AIS
	MSRDi	MS RDI
	PTAD	Pointer Activity
	K1K2	K1K2 Change

Selects SDH alarm for triggering Section Overhead data capture.

The corresponding query returns the selected SDH SOH alarm in discrete form listed above.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:SDH:SECTion?

Returns: <discrete>

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:SDH:PATH <discrete>

<discrete> =	HPRDi	HP-RDI
	PUNequipped	HP-UNEQ
	VCAis	TCM VC-AIS
	TCRDi	TCM TC-RDI
	ODI	TCM TC-ODI
	TCOom	TCM TC-OOM
	IAIS	TCM TC-IAIS

Selects SDH alarm for triggering Path Overhead data capture.

TCM alarms are only valid when the appropriate SDH Tandem Connection Monitoring functionality is enabled.

The corresponding query returns the selected SDH POH error in discrete form listed above.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:SDH:PATH?

Returns: <discrete>

SENSe subsystem - Receiver SDH Overhead Monitor Commands

:SENSe:DATA:TELecom:SDH:OCAPture:CHANnel:SELect <numeric>

<numeric> = 1 to 64 AU number

Selects the STM-1 Channel from which the overhead sequence will be captured.

The corresponding query returns the STM1 channel number currently selected, in numeric form.

:SENSe:DATA:TELecom:SDH:OCAPture:CHANnel:SELect?

Returns: <numeric>

:SENSe:DATA:TELecom:SDH:OCAPture:OHBYte <discrete>

<discrete> = A1A2 | BNDA1A2 | E1 | F1 | D1D3 | K1K2 | H1 | D4D12 | S1 | M0 | M1 | J1 | E2 | C2 | G1 | F2 | H4 | F3 | K3 | N1 | H1H2_1 | H1H2_2 | H1H2_3 | H3_1 | H3_2 | H3_3 Xrc

Selects the overhead channel to be captured.

A byte/channel may also be selected by using an 'Xrc' notation where 'r' specifies the row of the required byte and 'c' specifies the column. For example, specifying 'X24' will select the 4th byte on the 2nd row of the specified STM-1 structure.

The corresponding query returns the selected overhead capture channel in discrete form as listed above.

:SENSe:DATA:TELecom:SDH:OCAPture:OHBYte?

Returns: <discrete>

:SENSe:DATA:TELecom:SDH:OCAPture:TRIGger:SELection <discrete>

<discrete> =	MANual	Manual Trigger
	PRE	Pre-Capture Trigger
	CENTered	Centered-Capture Trigger
	POST	Post-Capture Trigger

Selects the type of trigger for Overhead Capture.

When MANual trigger is selected, capture is started using the :SENSe:DATA:TELecom:SDH:OCAPture command. PRE-trigger capture will capture up to 255 elements before the trigger pattern. CENTered capture captures elements either side of the trigger pattern. POST capture captures up to 255 elements after the trigger pattern.

The corresponding query returns the selected overhead capture trigger selection in discrete form as listed above.

:SENSe:DATA:TELecom:SDH:OCAPture:TRIGger:SELection?

Returns: <discrete>

:SENSe:DATA:TELecom:SDH:OCAPture:TRIGger:POLarity <discrete>

<discrete> =	ON	Triggers when capture data MATCHES trigger pattern
	ONNot	Triggers when capture data DOES NOT MATCH trigger pattern

Selects whether the trigger will start capture on data matching the trigger pattern or not matching the trigger pattern.

The corresponding query returns the selected trigger polarity.

:SENSe:DATA:TELecom:SDH:OCAPture:TRIGger:POLarity?

Returns: <discrete>

:SENSe:DATA:TELecom:SDH:OCAPture:TRIGger:PATTern <string>

<string> See Below

Sets the overhead capture trigger pattern as a string of hexadecimal digits. The number of hexadecimal characters is dependent on the overhead channel selected by :SENSe:DATA:TELecom:SDH:OCAPture:OHBYte. Two hexadecimal characters are required per byte, for example:

TCMACT - 1 byte "00" to "FF"

FAS - 6 bytes "000000000000" to "FFFFFFFFFFFF"

The corresponding query returns the current value of the trigger pattern in string form.

:SENSe:DATA:TELecom:SDH:OCAPture:TRIGger:PATTern?

Returns: <string> e.g.: "FF..FF"

:SENSe:DATA:TELecom:SDH:OCAPture:TRIGger:MASK <string>

<string> See Below

Sets the mask for the overhead capture trigger as a string of hexadecimal characters. Allows certain bits of the trigger pattern to masked. The number of hexadecimal characters is dependent on the overhead channel selected by :SENSe:DATA:TELecom:SDH:OCAPture:OHBYte.

The corresponding query returns the trigger mask in string form.

:SENSe:DATA:TELecom:SDH:OCAPture:TRIGger:MASK?

Returns: <string>

:SENSe:DATA:TELecom:SDH:OCAPture <discrete>

<discrete> =	STOP	Stop current current
	STARt	Start new capture

Stops or starts overhead sequence capture.

The corresponding query returns the capture status in discrete form as listed above.

:SENSe:DATA:TELecom:SDH:OCAPture?

Returns: <discrete>

SENSe subsystem - Result Returning Commands

SDH Last second Results

:SENSe:DATA? <string>

<string> = **"ECOunt:SDH:LSECond:<error>"** <error> is one of the following

BPViolation	Bi-polar Violation error count
FRAMe	Frame error count
RSBip	RS B1 BIP error count
MSBip	MS B2 BIP error count
MSRei"	MS REI error count.
PBIP	AU B3 BIP error count
HPRei	HP-REI error count
PIEC	PIEC error count
TRIB:PBIP	TU Path BIP error count
TRIB:REI	LP REI error count

<string> = **"ERATio:SDH:LSECond:<error>"** <error> is one of the following

BPViolation	Bi-polar Violation error ratio
FRAMe	Frame error ratio
RSBip	RS B1 BIP error ratio
MSBip	MS B2 BIP error ratio
MSRei	MS REI error ratio.
PBIP	AU B3 BIP error ratio
HPRei	HP-REI error ratio
PIEC	PIEC error ratio
TRIB:PBIP	TU Path BIP error ratio
TRIB:REI	LP REI error ratio

Returns: <numeric>

TCM Last second Results

:SENSe:DATA? <string>

<string> = **"ECOunt:SDH:LSECond:TCM:<error>"** <error> is one of the following

PIEC"	TCM PIEC error count
REI"	TCM REI error count
OEI"	TCM OEI error count
ERR"	TCM Error error count.
TU:PIEC"	TCM PIEC error count
TU:REI"	TCM REI error count
TU:OEI"	TCM OEI error count
TU:ERR"	TCM Error error count.

<string> = **"ERATio:SDH:LSECond:TCM:<error>"** <error> is one of the following

PIEC"	TCM PIEC error ratio
REI"	TCM REI error ratio
OEI"	TCM OEI error ratio
ERR"	TCM Error error ratio
TU:PIEC"	TCM PIEC error ratio
TU:REI"	TCM REI error ratio
TU:OEI"	TCM OEI error ratio
TU:ERR"	TCM Error error ratio.

Returns: <numeric>

SDH Total Results

:SENSe:DATA? <string>

<string> = **"ECOunt:SDH:<error>"** <error> is one of the following

BPViolation	Bi-polar Violation error count
FRAMe	Frame error count
RSBip	RS B1 BIP error count
MSBip	MS B2 BIP error count
MSRei	MS REI error count
PBIP	Path B3 BIP error count
HPRei	HP-REI error count
PIEC	PIEC error count
TRIB:PBIP	TU Path BIP error count
TRIB:REI	LP REI error count

<string> = **"ERATio:SDH:<error>"** <error> is one of the following

BPViolation	Bi-polar Violation error count
FRAMe	Frame error ratio
RSBip	RS B1 BIP error ratio
MSBip	MS B2 BIP error ratio
MSRei	MS REI error ratio.
PBIP	Path B3 BIP error ratio
HPRei	HP-REI error ratio
PIEC	PIEC error ratio
TRIB:PBIP	TU Path BIP error ratio
TRIB:REI	LP REI error ratio

Returns: <numeric>

TCM Total Results

:SENSe:DATA? <string>

<string> = **"ECOunt:SDH:TCM:<error>"** <error> is one of the following

PIEC	TCM PIEC error count
REI	TCM REI error count

OEI	TCM OEI error count
ERR	TCM Error error count.

<string> = **"ERATio:SDH:TCM:<error>"** <error> is one of the following

PIEC	TCM PIEC error ratio
REI	TCM REI error ratio
OEI	TCM OEI error ratio
ERR	TCM Error error ratio

Returns: <numeric>

SDH G.828 Analysis Results

:SENSe:DATA? <string>

<string> = "**<Result type>:SDH:<Path Type>:G828**"

<Result type> is one of the following

ESEConds	Error Seconds
SESeconds	Severely Errored Seconds
SEPeriod	Severely Errored Period
EBCount	Errored block count
BBECount	Background block error count
ESRatio	Error Second Ratio
SESRatio	Severely Errored Second Ratio
SEPI	Severely Errored Period Intensity
BBERatio	Background Block Error ratio
UASeconds	Unavailable seconds
PUASeconds	Path Unavailable seconds

<Path type> is one of the following

RSBip	RSOH B1 block errors
MSBip	MSOH B2 block errors
MSRei	MSOH REI block errors
PBIP	HO Path B3 block errors
REI	HO Path REI block errors
TU:BIP	low path BIP
TU:REI	LP-REI
TCM:PIEC	HO TC Path IEC block errors
TCM:REI	HO TC Path REI block errors

SDH G.826 Analysis Results

:SENSe:DATA? <string>

<string> = **"<Result type>:SDH:<Path Type>:G826"**

<Result type> is one of the following

ESEConds	Error Seconds
SESeconds	Severely Errored Seconds
EBCount	Errored block count
BBECount	Background block error count
ESRatio	Error Second Ratio
SESRatio	Severely Errored Second Ratio
BBERatio	Background Block Error ratio
UASeconds	Unavailable seconds
PUASeconds	Path Unavailable seconds

<Path type> is one of the following

RSBip	RSOH B1 block errors
MSBip	MSOH B2 block errors
MSRei	MSOH REI block errors
PBIP	HO Path B3 block errors
REI	HO Path REI block errors
TU:BIP	low path BIP
TU:REI	LP-REI
TCM:PIEC	HO TC Path IEC block errors
TCM:REI	HO TC Path REI block errors

SDH Optical Power Result

:SENSe:DATA? <string>

<string> =	"OPOWer:SDH"	Optical power (dBm)

SDH Pointer Activity Results

:SENSe:DATA? <string>

<string> = **"PACTivity:SDH:<type>"** where <type> is one of the following

PVALue	AU Pointer value
NDFSeconds	AU Pointer NDF seconds
MNDFseconds	AU Pointer MNDF seconds
PCOunt	AU Pointer +ve Adj Count
PSEConds	AU Pointer +ve Adj Seconds
NCOunt	AU Pointer -ve Adj Count
NSEConds	AU Pointer -ve Adj Seconds
IOFFset	Implied VC4 Offset
TU:PVALue	TU Pointer value
TU:NDFSeconds	TU Pointer NDF seconds
TU:MNDFseconds	TU Pointer MNDF seconds
TU:PCOunt	TU Pointer +ve Adj Count
TU:PSEConds	TU Pointer +ve Adj Seconds
TU:NCOunt	TU Pointer -ve Adj Count
TU:NSEConds	TU Pointer -ve Adj Seconds
TU:IOFFset	Implied TU VC Offset

Returns: <numeric>

SDH Alarm Seconds Results

:SENSe:DATA? <string>

<string> = **"ASEConds:SDH:<alarm>"** <alarm> is one of the following

LOF	Loss Of Frame
OOF	Out Of Frame
AULop	Loss Of Pointer
MSAis	Multiplexer Section AIS
PAIS	Path AIS
MSRDi	Multiplexer Section Remote Defect
HPRDi	HP-RDI
PUNeq	Path Unequipped
AISC	concat AIS alarm
LOPC	concat LOP alarm
K1K2	K1K2 byte change
H4MF	H4 loss of multi-frame
TU:PUNeq	Tributary Path Unequipped
TU:RFI	
TU:LOP	TU Loss of Pointer
TU:PAIS	TU Path AIS
TU:RDI	LP-RDI
TU:P1P0	P1P0 Frame synchronization Loss
OPSL	Overhead Pattern Sync Loss

Returns: <numeric>

Enhanced RDI Alarm Seconds Results

<string> = **"ASEConds:SDH:HERDi:<alarm>"** <alarm> is one of the following

PAYLoad	Enhanced RDI Payload
SERVer	Enhanced RDI Server

CONNection	Enhanced RDI Connection
Returns:	<numeric>

TCM Alarm Seconds Results

:SENSe:DATA? <string>

<string> = **"ASEConds:SDH:TCM:<alarm>"** <alarm> is one of the following

OOM	high path Loss of multiframe
IAIS	high path Incoming AIS
RDI	high path Remote Defect Indication
ODI	high path Outgoing Defect Indication
UNEQ	high path Unequal Indication
VCAis	high path VC alarm indication signal
TU:OOM	low path Loss of multiframe
TU:IAIS	low path Incoming AIS
TU:RDI	low path Remote Defect Indication
TU:ODI	low path Outgoing Defect Indication
TU:UNEQ	low path Unequal Indication
TU:VCAis	low path VC alarm indication signal

Returns: <numeric>

FETCh subsystem

The FETCh subsystem is used to retrieve data directly accumulated by the instrument.

SDH Data Capture Results

**:FETCh:ARRay:DATA:TELecom:SDH:DCAPture:DATA?
<numeric>,<numeric>,<numeric>**

<numeric> = Frame Index.
<numeric> = STM-1 Number (Min = 1, Max = 64)
<numeric> = STM-0 Number (Min = 1, Max = 3)

Returns: <numeric>, <numeric>...<numeric>

Returns comma separated byte values for the specified columns of the selected frame. A STM-0 value of 1 will return the byte values for columns 1, 4 and 7 of the selected STM-1; a value of 2 will return the byte values for columns 2, 5 and 8 of the selected STM-1; while a value of 3 will return columns 3, 6 and 9 of the selected STM-1.

For example, if the STM-0 value is 2 for a specified STM-1, the bytes are returned as follows:

<col(2), row(1)>, <col(2), row(2)>, <col(2), row(3)>,…
<col(2), row(9)>, <col(5), row(1)>, <col(5), row(2)>,
<col(5), row(3)>,… <col(5), row(9)>, <col(8), row(1)>,
<col(8), row(2)>, <col(8), row(3)>,… <col(8), row(9)>

:FETCh:ARRay:DATA:TELecom:SDH:DCAPture:PDATa? <numeric>

<numeric> = Frame Index.

Returns: <numeric>, <numeric>...<numeric>

Returns the byte values of the Path Overhead from the specified frame.

**:FETCh:SCALar:DATA:TELecom:SDH:DCAPture:DATA?
<numeric>,<numeric,<numeric>,<discrete>**

<numeric> = Frame Index.
<numeric> = STM-1 Number (Min = 1, Max = 64)
<numeric> = STM-0 Number (Min = 1, Max = 3)

<discrete> = Section Overhead Byte Name

Returns: <numeric>

Returns the value of a specific Section Overhead byte within the STM-0 frame.

:FETCh:SCALar:DATA:TELecom:SDH:DCAPture:PDATa? <numeric>,<discrete>

<numeric> = Frame Index.

<discrete> = Path Overhead Byte Name

Returns: <numeric>

Returns the value of a specific Path Overhead byte in a captured frame.

SDH Overhead Bytes

:FETCh:ARRay:DATA:TELecom:SDH:OVERhead:DATA? <numeric>

<numeric> = 1 to 3 STM-0 group

The parameter identifies a set of columns within the selected STM-1. A Value of 1 selects columns 1,4 & 7, a value of 2 selects Columns 2,5 & 8, and a value of 3 selects Columns 3,6 & 9.

Returns the value of the selected section overhead as a comma seperated list of 27 integer numerical values in the range 0 to 255.

Returns: <numeric>, <numeric>,.....<numeric>

The values are arranged as shown

<row1 col1>,<row1 col2>,<row1 col3>.. ..<row1 col9>
<row2 col1>,<row2 col2>,<row2 col3>.. ..<row2 col9>
<row3 col1>.....
....<row8 col9>
<row9 col1>,<row9 col2>,<row9 col3>.. ..<row9 col9>

The channel to be monitored is identified by the command **:SENSe:DATA:TELecom:SDH:OVERhead:CHANnel**.

:FETCh:ARRay:DATA:TELecom:SDH:POVerhead:DATA?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the high order path overhead bytes as an array of 9 numeric values. Each numeric is in the range 0 to 255.

:FETCh:ARRay:DATA:TELecom:SDH:TU:POVerhead:DATA?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the low order path overhead bytes as an array of 9 numeric values. Each numeric is in the range 0 to 255.

:FETCh:SCALar:DATA:TELecom:SDH:OVERhead:DATA? <numeric>, <discrete>

<numeric> = 1 to 3 Column number

<discrete> = A1 | A2 | J0/Z0 | E1 | F1 | D1 | D2 | D3 | H1 | H2 | H3 | K1 | K2 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | S1 | M0 | M1 | E2 | B1 | B2 | X11 | X12 | X13 | X21 | X22 | X23 | X31 | X32 | X33 | X41 | X42 | X43 | X51 | X52 | X53 | X61 | X62 | X63 | X71 | X72 | X73 | X81 | X82 | X83 | X91 | X92 | X93 |

Returns: <numeric>

Returns the value of a single named byte of the selected transmitter section overhead. The required byte is specified by 2 command parameters.

The first parameter identifies a set of columns within the selected STM-1. A value of 1 selects columns 1,4 & 7, a value of 2 selects Columns 2,5 & 8, and a value of 3 selects Columns 3,6 & 9. For the STM-0 signal rate, only 1 is valid.

The second parameter identifies the specific byte in the selected set of columns. There are two ways of specifying this byte. The first is to use standard names where these are valid. The set of valid names is shown in the table above. The second method is to use an "Xrc" notation, where r is the numerical value of the bytes row in the transport overhead and c is the numerical value of the bytes column in the transport overhead.

This method allows access to ANY byte in the selected STM-1 / Column set.

:FETCh:SCALar:DATA:TELecom:SDH:POVerhead:DATA? <discrete>

<discrete>= C2 | G1 | F2 | H4 | F3 | K3 | N1 | B3 | J1

Returns: <numeric>

Returns the value of a single named byte of the selected foreground high order path overhead byte.

:FETCh:SCALar:DATA:TELecom:SDH:TU:POVerhead:DATA? <discrete>

<discrete>= C2 | G1 | F2 | H4 | F3 | K3 | N1 | B3 | J1

Returns: <numeric>

Returns the value of a single named byte of the selected foreground low order path overhead byte.

SDH Labelled Overhead Bytes

:FETCh:SCALar:DATA:TELecom:SDH:OVERhead:K1?

Returns: <numeric>

Returns the value of the K1 APS signalling overhead byte.

:FETCh:SCALar:DATA:TELecom:SDH:OVERhead:K2?

Returns: <numeric>

Returns the value of the K2 APS signalling overhead byte.

:FETCh:SCALar:DATA:TELecom:SDH:OVERhead:S1?

Returns: <numeric>

Returns the value of the S1 Synchronisation Status overhead byte.

SDH Overhead Trace Messages

:FETCh:ARRay:DATA:TELecom:SDH:TCM:APID?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the high order TC-APId as a comma seperated list of integers. Each integer is in the range 0 to 255. There is no block header.

:FETCh:ARRay:DATA:TELecom:SDH:J0?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the STM-N regenerator overhead J0 byte as a comma seperated list of integer numeric values. Each number is in the range 0 to 255. There is no block header.

:FETCh:ARRay:DATA:TELecom:SDH:J1?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the high order J1 path trace byte as a comma seperated list of integer numeric values. Each number is in the range 0 to 255. There is no block header

:FETCh:ARRay:DATA:TELecom:SDH:TU:J1?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the low order J1 path trace byte as a comma seperated list of integer numeric values. Each number is in the range 0 to 255. There is no block header

:FETCh:ARRay:DATA:TELecom:SDH:TU:J2?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the low order J2 path trace byte as a comma seperated list of integer numeric values. Each number is in the range 0 to 255. There is no block header

:FETCh:STRing:DATA:TELecom:SDH:J0?

Returns: <string>

Returns the value of the high order J0 path trace byte as a, 64 ASCII character string if CRC7 is not detected, 15 ASCII character string if CRC7 is detected. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:SDH:J1?

Returns: <string>

Returns the value of the high order J1 path trace byte as a, 64 ASCII character string if CRC7 is not detected, 15 ASCII character string if CRC7 is detected. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:SDH:TU:J1?

Returns: <string>

Returns the value of the low order J1 path trace byte as 15 ASCII character string. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:SDH:TU:J2?

Returns: <string>

Returns the value of the low order J2 path trace byte as a 15 ASCII character string. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:SDH:TCM:APID?

Returns: <string>

Returns the value of the high order TCM APID trace byte as a, 64 ASCII character string if CRC7 is not detected, 15 ASCII character string if CRC7 is detected. If the string contains any non printing characters then ~ is substituted.

SDH Overhead Sequence Capture Results

:FETCh:SCALar:DATA:TELecom:SDH:OCAPture:MINelement?

Returns: <numeric>

Returns the minimum element index of the captured sequence.

:FETCh:SCALar:DATA:TELecom:SDH:OCAPture:MAXelement?

Returns: <numeric>

Returns the maximum element index of the captured sequence.

:FETCh:SCALar:DATA:TELecom:SDH:OCAPture:FCOunt? <numeric>

<numeric> = Element Index

Returns: <numeric>

Returns the capture repeat count of the specified element in numeric form. Individual elements may be captured up to 65535 times before a new element is entered into the captured sequence.

The sequence element index (numeric parameter) can be in the range -255 to +255 depending on the trigger selection.

The element which triggered sequence capture (the element that met the trigger criteria) is specified by index 0. Since 256 elements may be captured, pre-trigger can capture elements indexed -255 to 0 whilst post-trigger capture can capture elements indexed 0 to +255.

:FETCh:STRing:DATA:TELecom:SDH:OCAPture:DATA? <numeric>

<numeric> = Element Index.

Returns: <string>

Returns the capture data of the specified element in string form. The data is represented by hexadecimal characters. The number of characters depends on the selected capture channel.

:FETCh:ARRay:DATA:TELecom:SDH:OCAPture? <numeric>

<numeric> = Number of elements to return.

Returns: <array>

Returns an array with the number of entries determined by <numeric> and seperated by CR/LF.

Each entry consists of an alphanumeric string and a numeric seperated by commas. The alphanumeric string provides the hexadecimal value of the captured data. The length of the string depends upon the overhead channel selected for capture, two hexadecimal characters/overhead byte. The numeric indicates indicates the number of frames for which the captured data existed. If this command is issued when a capture is being performed, some entries will contain no data. In this case 9.91E+37 is returned.

SYSTem Subsystem - SDH Trigger Output Commands

:SYSTem:TRIGger:RECeive:ERRor:SDH:SECTion <discrete>

<discrete> =	FRAMe	A1A2 Error
	RSBip	RS BIP (B1) Error
	MSBip	MS BIP (B2) Error
	MSRei	MS REI Error

Selects SDH Section Overhead error for trigger output when :SYSTem:TRIGger:RECeive:ERRor:STANdard is set to SOH.

The corresponding query returns the selected SDH SOH error in discrete form listed above.

:SYSTem:TRIGger:RECeive:ERRor:SDH:SECTion?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ERRor:SDH:PATH <discrete>

<discrete> =	PBIP	Path BIP (B3) Error
	HPRei	HP REI Error

Selects SDH Path Overhead error for trigger output when :SYSTem:TRIGger:RECeive:ERRor:STANdard is set to POH.

The corresponding query returns the selected SDH POH error in discrete form listed above.

:SYSTem:TRIGger:RECeive:ERRor:SDH:PATH?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ERRor:SDH:TCM <discrete>

<discrete> =	TCIec	TCM IEC Error
	TCRei	TCM REI Error
	OEI	OEI Error

Selects SDH Tandem Connection Monitoring error for trigger output when
:SYSTem:TRIGger:RECeive:ERRor:STANdard is set to TCM.

The corresponding query returns the selected SDH TCM error in discrete form listed above.

:SYSTem:TRIGger:RECeive:ERRor:SDH:TCM?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ERRor:SONet:TOH <discrete>

:SYSTem:TRIGger:RECeive:ALARm:SDH:SECTion <discrete>

<discrete> =	LOF	Loss of Frame
	OOF	Out of Frame
	MSAis	MS AIS
	MSRDi	MS RDI
	PTAD	Pointer Activity
	K1K2	K1K2 Change

Selects SDH Section Overhead alarm for trigger output when :SYSTem:TRIGger:RECeive:ALARm:STANdard is set to SOH.

The corresponding query returns the selected SDH SOH alarm in discrete form listed above.

:SYSTem:TRIGger:RECeive:ALARm:SDH:SECTion?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ALARm:SDH:PATH <discrete>

<discrete> =	PAIS	AU-AIS
	AISC	AU-AIS-C
	HPRDi	HP-RDI
	AULop	AU-LOP
	LOPC	AU-LOP-C
	PUNequipped	HP-UNEQ

Selects SDH Path Overhead alarm for trigger output when :SYSTem:TRIGger:RECeive:ALARm:STANdard is set to POH.

The corresponding query returns the selected SDH POH error in discrete form listed above.

:SYSTem:TRIGger:RECeive:ALARm:SDH:PATH?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ALARm:SDH:TCM <discrete>

<discrete> =	VCAis	VC-AIS

TCRDi	TC-RDI
ODI	TC-ODI
TCOom	TC-OOM
IAIS	TC-IAIS

Selects SDH Tandem Connection Monitoring alarm for trigger output when :SYSTem:TRIGger:RECeive:ALARm:STANdard is set to TCM.

The corresponding query returns the selected SDH TCM alarm in discrete form listed above.

:SYSTem:TRIGger:RECeive:ALARm:SDH:TCM?

Returns: <discrete>

5

SONET SCPI Command Reference

SOURce subsystem - Transmitter SONET Settings Commands, see page 5-4
SOURce subsystem - Transmitter SONET Overhead Set Up, see page 5-11
SOURce subsystem – SONET Error Test Functions, see page 5-26
SOURce subsystem – Transmitter Alarm Test Functions, see page 5-34
SOURce subsystem - Pointer Adjust Test Functions, see page 5-37
SOURce subsystem - Frequency Offset Test Functions, see page 5-42
SENSe subsystem - Receiver SONET Settings, see page 5-51
SENSe subsystem - Receiver SONET Test Function Commands, see page 5-56
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SONET Command Reference

SONET Command Reference

This chapter contains detailed information on the SCPI (Standard Commands for Programming Instruments) and IEEE 488.2 common commands you will use when writing programs to control your Instrument for SONET operation.

Please also refer to chapter 2 Common Commands for general information on SCPI command formats and for a list of commands

OUTPut subsystem

:OUTPut:TELecom:SONet:PAYLoad:LOCation <discrete>

<discrete> =	INTernal	
	EXTernal	

This command selects the SONet transmitter drop payload location

The corresponding query returns the SONet transmitter drop payload location in discrete form as listed above.

:OUTPut:TELecom:SONet:PAYLoad:LOCation?

Returns: <discrete>

:OUTPut:TELecom:SONet:DROP:CODE <discrete>

<discrete> =	NRZ	optical only
	CMI	140Mb/s only
	B3ZS	DS3
	HDB3	34Mb/s,8Mb/s,2Mb/s
	B8ZS	DS1
	AMI	DS1

Selects the drop interface line code for the SONet payload.

The corresponding query returns the SONet drop interface line code in discrete form as listed above.

:OUTPut:TELecom:SONet:DROP:CODE?

Returns: <discrete>

SOURce subsystem - Transmitter SONET Settings Commands

:SOURce:DATA:TELecom:SONet:RATE <discrete>

Controls the characteristics of the instrument's output ports.

<discrete> =	OC192	10Gb/s
	OC48	2.5Gb/s
	OC12	622Mb/s
	OC3	155Mb/s optical
	STS3	155Mb/s electrical
	OC1	52Mb/s optical
	STS1	52Mb/s electrical

Sets the output rate for the instrument output port.

The corresponding query returns the output port rate in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:RATE?

Returns: <discrete>

SONET Mapping Settings

SPE Layer Selection

:SOURce:DATA:TELecom:SONet:SPE:TYPE <discrete>

<discrete> = STS3C
STS1
STS12C
STS48C
STS192C

Selects the SPE mapping into an STS-N frame.

The corresponding query returns the SPE layer in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:SPE:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:STS3 <numeric>

<numeric> = 1 to 64 STS3 number under test.

Selects the transmitted STS-3 that is selected for test.

Only valid if :SOURce:DATA:TELecom:SONet:RATE is set to a rate higher than STS-3.

The corresponding query returns the STS-3 selected for test in numeric form, as listed above.

:SOURce:DATA:TELecom:SONet:STS3?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:STS1 <numeric>

<numeric> = 1 to 3 STS1 Number

Selects the SONET Transmitter active STS-1 within the STS-3.

The corresponding query returns the active STS-1 in numeric form.

:SOURce:DATA:TELecom:SONet:STS1?

Returns: <numeric>

Payload Layer Selection

:SOURce:DATA:TELecom:SONet:PAYLoad <discrete>

<discrete> =	BULK	Bulk Filled

This command controls the transmitter SONET payload for single payload cases.

The corresponding query returns the payload in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:PAYLoad?

Returns: <discrete>

VT Group

:SOURce:DATA:TELecom:SONet:VTG <numeric>

<numeric> =	1 to 7	VT Group

Selects the SONET Transmitter active VT Group within the foreground STS1.

The corresponding query returns the active VT Group in numeric form.

:SOURce:DATA:TELecom:SONet:VTG?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:VT <numeric>

<numeric> =	1 to 3	Tributary number forVT2
<numeric> =	1 to 4	Tributary number forVT1.5

Selects the SONET Transmitter active VT within the selected VT Group.

The corresponding query returns the active tributary in numeric form.

:SOURce:DATA:TELecom:SONet:VT?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:PAYLoad:OFFSet <numeric> <suffix>

<numeric> =	-100.0 to +100.0	Parts per Million
	-0.000100 to +0.000100	% or Ratio
<suffix>	PPM	Parts Per Million
	PCT	Percentage

Sets the amount of payload frequency offset. If Ratio is chosen as the method of specifying offset, no suffix is required.

The corresponding query returns the offset in numeric form.

:SOURce:DATA:TELecom:SONet:PAYLoad:OFFSet?

Returns: <numeric> ppm

Background Settings

:SOURce:DATA:TELecom:SONet:STS1:BACKground <discrete>

<discrete> =	UNEQuipped	Fixed at 00000000
	AS_FG	As Foreground

Selects the payload in the background (non-test) STS-1s. This command only applies if the interface rate is higher than STS-1.

The corresponding query returns the type of payload in the background STS-1s in discrete short form.

:SOURce:DATA:TELecom:SONet:STS1:BACKground?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:STS1:BACKground:PAYLoad:PATTern <discrete>

<discrete> =	PRBS9	2^9-1
	PRBS15	2^{15}-1
	NUMBered	framed TU12 or TU11
	B1100	word 1100

Selects the background payload pattern for STS1s within the foreground VT Group.

The corresponding query returns the background payload pattern in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:STS1:BACKground:PAYLoad:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:VT:BACKground:PAYLoad:PATTern <numeric> <discrete>

<numeric> =	1 to 7	VT Group to be configured
<discrete> =	VT2	VT2 structure
	VT1.5	VT1.5 structure
	USER	User Defined

Selects the structure in a background VTGroup. This command is only valid if the selected VTGroup is not the current foreground..

The corresponding query returns the specified VTGroup background structure in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:VT:BACKground:PAYLoad:PATTern ? <numeric>

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:VT:BACKground:PAYLoad:PATTern :USER <numeric> <numeric>

<numeric> =	1 to 7	VT Group to be configured
<numeric> =	0 to 256	8 bit pattern

Sets the User Pattern to be transmitted in the specified background VT Group. This command is only valid if the VT Group selected is not the current foreground.

The 8-bit numeric value can be entered using #b for binary representation, #h for hexadecimal or just as a decimal number.

The corresponding query returns the specified VT Group background word pattern.

:SOURce:DATA:TELecom:SONet:VT:BACKground:PAYLoad:PATTern :USER? <numeric>

Returns: <discrete>

SOURce subsystem - Transmitter SONET Overhead Set Up

Lists the settings for the commands associated with the TRANSMIT OVERHEAD SET UP display. The following commands are only available when an SONET transmit signal rate is active.

:SOURce:DATA:TELecom:SONet:OVERhead:DEFault

Sets all overhead bytes to their default value:

:SOURce:DATA:TELecom:SONet:OVERhead:DATA <numeric>, <numeric>, <discrete>, <numeric>

<numeric> =	1 to 16	STS-3 Number
<numeric> =	1 to 3	Column Number
<discrete> =	A1 | A2 | E1 | F1 | D1 | D2 | D3 | K1 | K2 | H1 |	
	| D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12	
	S1/Z1 | M0/M1 | Z2 | E2	
	X11 | X12 | X13 | X21 | X22 | X23 | X31 | X32 | X33 |	
	X41 | X42 | X43 | X51 | X52 | X53 | X61 | X62 | X63 |	
	X71 | X72 | X73 | X81 | X82 | X83 | X91 | X92 | X93 |	
<numeric> =	0 to 255	Byte Value

Sets the value of the selected transmitter section overhead byte. All overhead bytes in the transmitted signal can be configured. The required byte is specified by 4 command parameters.

The first parameter, STS-3 Number, identifies an STS-3 within the signal. The acceptable range for this parameter will depend on the selected transmit signal rate. For the STS-1 signal rate only 1 is valid.

The second parameter identifies a set of columns within the selected STS-3. A Value of 1 selects columns 1,4 & 7, a value of 2 selects Columns 2,5 & 8, and a value of

3 selects Columns 3,6 & 9. For the STS-1 signal rate only 1 is valid.

The third parameter identifies the specific byte in the selected set of columns. There are two ways of specifying this byte. The first is to use standard names where these are valid. The set of valid names is shown in the table above. The second method is to use an "Xrc" notation, where r is the numerical value of the bytes row in the transport overhead and c is the numerical value of the bytes column in the transport overhead. This method allows access to ANY byte in the selected STS-3 / Column set.

The fourth command parameter is the new value that will be transmitted in the specified byte. This value can be specified in hex, octal or decimal format.

The corresponding query returns the value of the byte named within the selected STS-3 column.

:SOURce:DATA:TELecom:SONet:OVERhead:DATA? <numeric>, <numeric>, <discrete>

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern <discrete>

<discrete> =	FIXed	Fixed Byte Sequence
	B16Crc	16 Byte Sequence (with CRC)
	B64	64 Byte Sequence

Sets the type of pattern that is to be transmitted in the J0 byte of the STS regenerator section overhead. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames. Default is FIXed.

The corresponding query returns the type of pattern being transmitted in overhead byte J0 in discrete form as listed above.

SOURce subsystem - Transmitter SONET Overhead Set Up

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:FIXed <numeric>

<numeric> = 0 to 255 Byte Value

Sets the fixed byte value of the J0 byte. Only relevant when :SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern is set to FIXed.

The corresponding query returns the fixed byte value of the J0 byte as a numeric.

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:FIXed?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:B16Crc <string>

Sets the 16-byte sequence of the J0 byte of the regenerator section overhead. The command parameter is a 15 character long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only available when :SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern is set to B16Crc.

The corresponding query returns the value of the J0 sequence as a 15-byte string. If the string contains any non-printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:B16Ccrc?

Returns: <string>

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:B64 <string>

Sets the 64-byte sequence of the J0 byte of the regenerator section overhead.

If the string is not 64 characters long the instrument will either append NULLS or truncate the string and terminate with a CR/LF to make it 64 characters long. The pattern repeats every 64 characters and is transmitted character by character in subsequent frames.

Only available when :SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern is set to B64.

The corresponding query returns the value of the 64-byte J0 sequence as a string. If the string contains any non-printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:B64?

Returns: <string>

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:ARRay?

Returns: <block>

Returns the J0 trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern.

:SOURce:DATA:TELecom:SONet:OVERhead:SBYTe <discrete>

<discrete> =	SYNChronized	(0000) Synchronized - traceability unknown

STR1	(0001) Stratum 1 traceable
STR2	(0111) Stratum 2 traceable
TRANsit	(0100) Transit
STR3	(1010) Stratum 3 traceable
STRE3	(1101) Stratum 3E
SONet	(1100) SONET minimum clock traceable
NETWork	(1110) Network synchronization
DONTusesync	(1111)

Selects the SONET SYNC message type (S1 Byte Bits 5 to 8).

The corresponding query returns the Sync Message type in discrete form as listed above. If the SONET SYNC message type is not defined, then the query will return REServed.

:SOURce:DATA:TELecom:SONet:OVERhead:SBYTe?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:POVerhead:DATA <discrete>,<numeric>

<discrete>= C2 | G1 | F2 | H4 | Z3 | Z4 | N1

<numeric>= 0 to 255 Byte Value

Sets the value of the specified STS-3, STS-12c, STS-48c and STS-192c foreground high order path overhead byte.

The N1 byte can only be set when the command **:SOURce:DATA:TELecom:SDH:TCM:HPATh** is set to FALSE.

The corresponding query returns the byte specified in numeric form, as described above.

:SOURce:DATA:TELecom:SONet:POVerhead:DATA? <discrete>

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern <discrete>

<discrete> =	B16Crc	16 Byte Sequence (with CRC)
	B64	64 Byte Sequence

Sets the type of sequence to be transmitted within the J1 byte of the foreground high order path overhead.

The corresponding query returns the specified sequence type in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern:B16Crc <string>

Sets the 16-byte sequence of the J1 byte of the foreground high order path overhead. The command parameter is a 15 characters long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only valid when :SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern is set to B16Crc.

The corresponding query returns the value of the J1 sequence as a 15-byte string. If the string contains any non printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern:B64 <string>

Sets the 64-byte sequence of the J1 byte of the foreground high order path overhead.

If the string is not 64 characters long the instrument will either append NULLS or truncate the string and terminate with a CR/LF to make it 64 characters long. The pattern repeats every 64 characters and is transmitted character by character in subsequent frames.

Only available when :SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern is set to B64.

The corresponding query returns the value of the 64-byte J1 sequence as a string. If the string contains any non-printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern:B64?

Returns: <string>

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern:ARRay?

Returns: <block>

Returns the high order J1 trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern.

:SOURce:DATA:TELecom:SONet:POVerhead:SLABel <discrete>

<discrete> =	UNEQuipped	Unequipped (00000000)
	EQUipped	Equipped (00000001)
	VTSTructure	VT Structure STS-1 SPE (00000010)
	LOCKed	Locked VT (00000011)
	DS3asyn	Asynchronous DS3 (00000100)

DS4Naasyn	Asynchronous DS4NA (00010010)
ATM	ATM (00010011)
DQDB	DQDB (00010100)
FDDI	FDDI (00010101)
HDLC	HDLC(00010110)
BULK	Bulk Filled (11111110)

Sets the value of the path label (C2 Byte) of the foreground high order path overhead.

To set the byte to any value, use the :SOURce:DATA:TELecom:SONet:POVerhead:DATA command.

The corresponding query returns the value of the C2 byte in discrete short form. If the value of the signal label is not defined, the query will return REServed.

:SOURce:DATA:TELecom:SONet:POVerhead:SLABel?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:VT:POVerhead:DATA <discrete>,<numeric>

<discrete>= C2 | G1 | F2 | H4 | Z3 | Z4

<numeric>= 0 to 255 Byte Value

Sets the value of the specified STS-3, STS-12c, STS-48c and STS-192c foreground low order path overhead byte.

The corresponding query returns the byte specified in numeric form, as described above.

:SOURce:DATA:TELecom:SONet:VT:POVerhead:DATA? <discrete>

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J1:PATTern <discrete>

<discrete> =	B16Crc	16 Byte Sequence (with CRC)
	B64	64 Byte Sequence

Sets the type of sequence to be transmitted within the J1 byte of the foreground low order path overhead.

The corresponding query returns the specified sequence type in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J1:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J1:PATTern:B16Crc <string>

Sets the 16-byte sequence of the J1 byte of the foreground low order path overhead. The command parameter is a 15 characters long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only valid when :SOURce:DATA:TELecom:SONet:VT:POVerhead:J1:PATTern is set to B16Crc.

The corresponding query returns the value of the J1 sequence as a 15-byte string. If the string contains any non printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J1:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J1:PATTern:B64 <string>

Sets the 64-byte sequence of the J1 byte of the foreground low order path overhead.

If the string is not 64 characters long the instrument will either append NULLS or truncate the string and terminate with a CR/LF to make it 64 characters long. The pattern repeats every 64 characters and is transmitted character by character in subsequent frames.

Only available when :SOURce:DATA:TELecom:SONet:VT:POVerhead:J1:PATTern is set to B64.

The corresponding query returns the value of the 64-byte J1 sequence as a string. If the string contains any non-printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J1:PATTern:B64?

Returns: <string>

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J1:PATTern:ARRay?

Returns: <block>

Returns the low order J1 trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using:SOURce:DATA:TELecom:SONet:VT:POVerhead:J1:PATTern .

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J2:PATTern <discrete>

<discrete> = B16Crc 16 Byte Sequence (with CRC)

Sets the type of sequence to be transmitted within the J2 byte of the foreground low order path overhead.

The corresponding query returns the specified sequence type in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J2:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J2:PATTern:B16Crc <string>

Sets the 16-byte sequence of the J2 byte of the foreground low order path overhead. The command parameter is a 15 characters long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only valid when :SOURce:DATA:TELecom:SONet:VT:POVerhead:J2:PATTern is set to B16Crc.

The corresponding query returns the value of the J2 sequence as a 15-byte string. If the string contains any non printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J2:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J2:PATTern:ARRay?

Returns: <block>

Returns the low order J1 trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using :SOURce:DATA:TELecom:SONet:VT:POVerhead:J2:PATTern.

:SOURce:DATA:TELecom:SONet:VT:POVerhead:SLABel <discrete>

<discrete> =	UNEQuipped	Unequipped (00000000)
	EQUipped	Equipped (00000001)
	VTSTructure	VT Structure STS-1 SPE (00000010)
	LOCKed	Locked VT (00000011)
	DS3asyn	Asynchronous DS3 (00000100)
	DS4Naasyn	Asynchronous DS4NA (00010010)
	ATM	ATM (00010011)
	DQDB	DQDB (00010100)
	FDDI	FDDI (00010101)
	HDLC	HDLC(00010110)
	BULK	Bulk Filled (11111110)

Sets the value of the path label (C2 Byte) of the foreground low order path overhead.

To set the byte to any value, use the :SOURce:DATA:TELecom:SONet:VT:POVerhead:DATA command.

The corresponding query returns the value of the C2 byte in discrete short form. If the value of the signal label is not defined, the query will return REServed.

:SOURce:DATA:TELecom:SONet:VT:POVerhead:SLABel?

Returns: <discrete>

Overhead Sequences Commands

:SOURce:DATA:TELecom:SONet:SEQuence:STS1 <numeric>

<numeric> =	1 to 3	STS-1 number

SOURce subsystem - Transmitter SONET Overhead Set Up

Selects the STS-1 Channel from which the overhead sequence will be generated.

The corresponding query returns the STS-1 channel number currently selected, in numeric form.

:SOURce:DATA:TELecom:SONet:SEQuence:STS1?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:SEQuence:STS3:SELect <numeric>

<numeric> = 1 to 64 STS-3 number

Selects the STS-3 Channel from which the overhead sequence will be generated.

The corresponding query returns the STS-3 channel number currently selected, in numeric form.

:SOURce:DATA:TELecom:SONet:SEQuence:STS3:SELect?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:SEQuence:OHBYte <discrete>

<discrete> = A1A2 | BNDA1A2 | E1 | F1 | D1D3 | K1K2 | H1 | D4D12 | S1 | M0 | M1 | J1 | E2 | C2 | G1 | F2 | H4 | F3 | K3 | N1 | H1H2 | H3
Xrc

Selects the overhead channel to be used to transmit a sequence.

A byte/channel may also be selected by using an 'Xrc' notation where 'r' specifies the row of the required byte and 'c' specifies the column. For example, specifying 'X24' will select the 4th byte on the 2nd row of the specified STS-3 structure.

The corresponding query returns the selected overhead capture channel in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:SEQuence:OHBYte?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:SEQuence:DEFault

Restores all sequence variables to their default values.

:SOURce:DATA:TELecom:SONet:SEQuence:INCRement

Resets the sequence repeat counts and data values and inserts incrementing values.

:SOURce:DATA:TELecom:SONet:SEQuence:FCOunt <numeric>,<numeric>

<numeric> =	1 to 256	Sequence Element Index
<numeric> =	0 to 65535	Sequence Element Repeat Count

For the selected sequence element specifies the number of frames in which the element data is to be transmitted.

The corresponding query returns the frame count for the specified sequence element.

:SOURce:DATA:TELecom:SONet:SEQuence:FCOunt? <numeric>

Returns: <numeric> Frame count

:SOURce:DATA:TELecom:SONet:SEQuence:DATA <numeric>,<string>

<numeric> =	1 to 256	Element Index
<string>	See Below	Element Data

Sets the sequence data pattern for the designated element to the hexadecimal value contained in the string. The number of hexadecimal characters is dependent on the overhead channel selected by :SOURce:DATA:TELecom:SONet:SEQuence:OHBYte.

Two hexadecimal characters are required per byte, for example:

TCMACT - 1 byte "00" to "FF"

FAS - 6 bytes "000000000000" to "FFFFFFFFFFFF"

The corresponding query returns the data for the specified sequence element in string form.

:SOURce:DATA:TELecom:SONet:SEQuence:DATA? <numeric>

<numeric> = 1 to 256

Returns: <string>

:SOURce:DATA:TELecom:SONet:SEQuence:MODE <discrete>

<discrete> =	SINGle	Single Run
	REPeat	Repeat Run

Selects whether to run a sequence once or repeatedly.

The corresponding query returns the type of sequence in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:SEQuence:MODE?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:SEQuence <discrete>

<discrete> =	STOP	Stop current sequence
	STARt	Start new sequence

Stops or starts a Single or Repeat run Sequence.

The corresponding query returns the Sequence status in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:SEQuence?

Returns: <discrete>

SOURce subsystem - SONET Error Test Functions

:SOURce:DATA:TELecom:SONet:ERRor:GROup <discrete>

<discrete> =	PHYSical	Physical Errors
	TRANsport	SONET Transport Errors
	PATH	SONET Path Errors
	PATTern	Pattern Errors

Selects Sonet transmit test function Error Group. Further selection of :SOURce:DATA:TELecom:SONet:ERRor:RATE is required. Selection of PATTern results in BIT error type being selected

The corresponding query returns the Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:ERRor:GROup?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:ERRor:PHYSical <discrete>

<discrete> =	EFRame	Entire frame or data errors

Selects Physical Error Type to generate. Further selection of :SOURce:DATA:TELecom:SONet:ERRor:RATE is required.

The corresponding query returns the Physical Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:ERRor:PHYSical?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:ERRor:TRANsport <discrete>

<discrete> =	FRAMe	A1A2 frame errors
	CVS	CV-S (Section B1 BIP) Errors
	CVL	CV-L (Line B2 BIP) Errors
	REIL	REI-L (Line FEBE) Errors

Selects Transport Error Type to generate. Further selection of :SOURce:DATA:TELecom:SONet:ERRor:RATE is required.

The corresponding query returns the Transport Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:ERRor:TRANsport?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:ERRor:PATH <discrete>

<discrete> =	CVP	CV-P (Path B3 BIP) Errors
	REIP	REI-P (Path FEBE) Errors
	REIV	REI-V (VT Path FEBE) Errors
	CVV	CV-V (VT Path BIP) Errors

Selects Path Error Type to generate. Further selection of :SOURce:DATA:TELecom:SONet:ERRor:RATE is required.

The corresponding query returns the Path Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:ERRor:PATH?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:ERRor:PATTern <discrete>

<discrete> = BIT

Selects Pattern Error Type to generate. Further selection of :SOURce:DATA:TELecom:SONet:ERRor:RATE is required.

The corresponding query returns the Pattern Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:ERRor:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:ERRor:PDH <discrete>

<discrete> = BIT

Selects PDH Error Type to generate. Further selection of :SOURce:DATA:TELecom:SONet:ERRor:RATE is required.

The corresponding query returns the PDH Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:ERRor:PDH?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:ERRor:DSN <discrete>

<discrete> = BIT

Selects DSN Error Type to generate. Further selection of :SOURce:DATA:TELecom:SONet:ERRor:RATE is required.

The corresponding query returns the DSN Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:ERRor:DSN?

Returns: <discrete>

:SOURce:DATA:TELecom:ERRor:SINGle

Injects a single error.

There is no corresponding query.

:SOURce:DATA:TELecom:SONet:ERRor:RATE <discrete>

<discrete> =	NONE	Errors Off
	EALL	Error All
	APSThreshold	APS Threshold (MS Bit only)
	E_3	Line rate dependent
	E_4	Line rate dependent
	E_5	Line rate dependent
	E_6	
	E_7	
	E_8	
	E_9	
	USER	User defined error rate

Selects the transmitter Error Rate of the error type (with the exception of EFRame and FRAMe selections) selected by the Test Error Group selection commands.

The corresponding query returns the selected transmitter Error Rate in discrete form, as listed above.

Note — If this query returns USER, then :SOURce:DATA:TELecom:SONet:ERRor:RATE? must be used to discover the currently injected error rate.

:SOURce:DATA:TELecom:SONet:ERRor:RATE?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:ERRor:RATE:USER <numeric>

<numeric>=	9.9E-9 to 1.7E-3	mantissa resolution 0.1, exponent resolution 1

Sets the user defined Error Add rate. :SOURce:DATA:TELecom:SONet:ERRor:RATE must be set to USER.

Note	The maximum user defined error rate is dependent on both error type and line rate.

:SOURce:DATA:TELecom:SONet:ERRorRATE:USER:ACTion <boolean>

<boolean>=	OFF	
	ON	User Value set as Error Rate

Sets the user defined Error Add rate specified by :SOURce:DATA:TELecom:SONet:ERRor:RATE:USER.

The corresponding query returns the boolean state of the User Rate.

:SOURce:DATA:TELecom:SONet:ERRor:RATE:USER:ACTion?

Returns: <boolean>

:SOURce:DATA:TELecom:SONet:ERRor:RATE:FRAMe <discrete>

<discrete> =	NONE	Errors Off
	ONE	1 in 4
	TWO	2 in 4
	THRee	3 in 4
	FOUR	4 in 4

Selects the transmitter Frame Error Rates of the error type EFRame and FRAMe selected by :SOURce:DATA:TELecom:SONet:ERRor:TRANsport <discrete>.

The corresponding query returns the selected transmitter Frame Error Rate in discrete form, as listed above.

:SOURce:DATA:TELecom:SONet:ERRor:RATE:FRAMe?

Returns: <discrete>

The corresponding query returns the user defined Frame Error Add rate in numeric form.

:SOURce:DATA:TELecom:SONet:ERRor:RATE:USER?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:ERRor:APSThreshold:NERRors <numeric>

<numeric> =	0 to 640	for STS-1
	0 to 1920	for STS-3
	0 to 7680	for STS-12
	0 to 30720	for STS-48
	0 to 122880	for STS-192

Sets the number of errors for the APS Threshold when :SOURce:DATA:TELecom:SONet:ERRor:RATE is set to APSThreshold. Default = 0.

The corresponding query returns the number of errors selected for the APS Threshold in numeric form.

:SOURce:DATA:TELecom:SONet:ERRor:APSThreshold:NERRors?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:ERRor:APSThreshold:EINTerval <discrete>

<discrete> =		
	MS10	10 milliseconds
	MS100	100 milliseconds
	S1	1 second
	S10	10 seconds
	S100	100 seconds
	S1000	1,000 seconds
	S10000	10,000 seconds

Sets the interval between APS Threshold errors when **:SOURce:DATA:TELecom:SDH:ERRor:RATE** <discrete>is set to APSThreshold .

The corresponding query returns the APS Threshold error interval in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:ERRor:APSThreshold:EINTerval?

Returns: <discrete>

SOURce subsystem - Transmitter Alarm Test Functions

:SOURce:DATA:TELecom:SONet:ALARm:GROup <discrete>

<discrete> =	PHYSical	Common Alarms
	TRANsport	Transport Alarms
	PATH	Path Alarms

Selects Alarm Group. Further selections from the group alarms must be made using :SOURce:DATA:TELecom:SONet:ALARm:PHYSical, :SOURce:DATA:TELecom:SONet:ALARm:TRANsport, :SOURce:DATA:TELecom:SONet:ALARm:PATH…etc, and finally :SOURce:DATA:TELecom:ALARm should be set to ON to activate the alarm selected.

The corresponding query returns the Alarm Group selected in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:ALARm:GROup?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:ALARm:PHYSical <discrete>

<discrete> =	LOS	Loss of Signal Alarm

Selects Physical Alarms.

The corresponding query returns the Physical Alarm selected in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:ALARm:PHYSical?

Returns: <discrete>

SOURce subsystem - Transmitter Alarm Test Functions

:SOURce:DATA:TELecom:SONet:ALARm:TRANsport <discrete>

<discrete> =	LOF	Loss of Frame
	SEF	Severely Errored Frame
	AISL	AIS-L alarm indication signal
	RDIL	RDI-L remote defect indication

Selects Transport Alarms.

The corresponding query returns the Transport Alarm selected in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:ALARm:TRANsport?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:ALARm:SEF

Sets the OOF alarm Active.There is no corresponding query

:SOURce:DATA:TELecom:SONet:ALARm:PATH <discrete>

<discrete> =	AISP	Path AIS
	LOPP	LOP-P Loss of pointer
	RDIP	RDI-P remote defect indication
	PUNequipped	Path Unequipped

Selects Path Alarms.

The corresponding query returns the Path Alarm selected in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:ALARm:PATH?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:ALARm:HERDI <discrete>

<discrete> =	OFF	HI Path RDI no defect, non-enhanced
	PAYLoad	HI Path RDI payload enhanced
	SERVer	HI Path RDI server defect enhanced
	CONNection	HI Path RDI connection enhanced

Selects HI Path Enhanced RDI Alarm state.

The corresponding query returns the HI Path Enhanced RDI Alarm state selected in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:ALARm:HERDI?

Returns: <discrete>

:SOURce:DATA:TELecom:ALARm <boolean>

<boolean> =	0 or OFF
	1 or ON

Enables and disables Alarm Generation.

The corresponding query returns the Alarm Generation state as 0 or 1.

:SOURce:DATA:TELecom:ALARm?

Returns: <boolean>

SOURce subsystem - Pointer Adjust Test Functions

:SOURce:DATA:TELecom:SONet:POINter <discrete>

<discrete> =	BURSt	Pointer Burst
	NPOinter	New Pointer Value
	OFFSet	Pointer Offset

Selects the Pointer Test Function.

The corresponding query returns the Pointer Test Function selected in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:POINter?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:POINter:TYPE <discrete>

<discrete> =	SPE	SPE Pointer
	VT	SPE Pointer

Selects the Pointer Type.

The corresponding query returns the Pointer Type selected in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:POINter:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:POINter:BURSt:ACTion

Forces the pointer value to change according to the burst size and direction set using the following commands
:SOURce:DATA:TELecom:SONet:POINter:BURSt:DIRection and
:SOURce:DATA:TELecom:SONet:POINter:BURSt:SIZE.

To use this function the command
:SOURce:DATA:TELecom:SONet:POINter should be set to BURSt.

There is no corresponding query.

:SOURce:DATA:TELecom:SONet:POINter:BURSt:DIRection <discrete>

<discrete> =	INCRement	Increment Pointer Value
	DECRement	Decrement Pointer Value
	ALTernate	Burst placed in opposite direction to last burst

Selects the Pointer Burst Direction.

The corresponding query returns the Pointer Burst Direction selected in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:POINter:BURSt:DIRection?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:POINter:BURSt:SIZE <numeric>

<numeric> = 1 to 10

Selects the Pointer Burst Size.

The corresponding query returns the Pointer Burst Size set.

:SOURce:DATA:TELecom:SONet:POINter:BURSt:SIZE?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:POINter:NEW:ACTion

Forces the pointer value to adopt the New Pointer value and new flag status, set using the following commands :SOURce:DATA:TELecom:SONet:POINter:NEW:VALue and :SOURce:DATA:TELecom:SONet:POINter:NEW:FLAG.

To use this function the command :SOURce:DATA:TELecom:SONet:POINter should be set to NEW.

There is no corresponding query.

:SOURce:DATA:TELecom:SONet:POINter:NEW:VALue <numeric>

<numeric> = 0 to 782

Selects the New Pointer Value.

The corresponding query returns the New Pointer Value set, in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:POINter:NEW:VALue?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:POINter:NEW:FLAG <discrete>

<discrete> =	NNDF	No New Data Flag
	NDF	New Data Flag

Selects whether a New Pointer Data Flag is generated.

The corresponding query returns the New Pointer Flag set, in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:POINter:NEW:FLAG?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:POINter:OFFSet:ACTion <boolean>

<boolean> =	0 or OFF
	1 or ON

Enables and Disables the Pointer Offset Test Function. The type of Offset and offset rate are set using the following commands:

:SOURce:DATA:TELecom:SONet:POINter:OFFSet and
:SOURce:DATA:TELecom:SONet:POINter:OFFSe:RATE

To use this function the command
:SOURce:DATA:TELecom:SONet:POINter should be set to

OFFSet and :SOURce:CLOCk:SONet:FOFFset should be set to OFF.

The corresponding query returns the Pointer Offset Test Function active state as 0 or 1.

:SOURce:DATA:TELecom:SONet:POINter:OFFSet:ACTion?

Returns: <boolean>

:SOURce:DATA:TELecom:SONet:POINter:OFFSet <discrete>

<discrete> =	SIGNal	Signal offset
	PAYLoad	Payload Offset

Selects the Pointer Offset Type.

The corresponding query returns the Pointer Offset Type selected, in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:POINter:OFFSet?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:POINter:OFFSe:RATE <numeric>

<numeric> = -100.0 to +100.0 parts per million

Selects the Pointer Offset Rate.

The corresponding query returns the Pointer Offset Rate set.

:SOURce:DATA:TELecom:SONet:POINter:OFFSet:RATE?

Returns: <numeric>

SOURce subsystem - Frequency Offset Test Functions

:SOURce:CLOCk:SONet:FOFFset <boolean>

<boolean> = 0 or OFF
1 or ON

Enables or disables the Clock Frequency Offset. The amount of Offset is set using :SOURce:CLOCk:SONet:FOFFset:OFFSet <numeric>.

The corresponding query returns the Clock Frequency Offset active state as 0 or 1.

:SOURce:CLOCk:SONet:FOFFset:ACTive?

Returns: <boolean>

:SOURce:CLOCk:SONet:FOFFset:OFFSet <numeric>

<numeric> = -999.00 to +999.00 ppm for 2.5Gb/s..52Mb/s
-999.00 to +999.00 ppm for 10Gb/s and PDH rates

Sets the amount of Clock Frequency Offset when Frequency Offset is enabled by setting :SOURce:CLOCk:SONet:FOFFset <boolean> to ON.

The corresponding query returns the amount of Clock Frequency Offset in parts per million.

:SOURce:CLOCk:SONet:FOFFset:OFFSet?

Returns: <numeric>

SOURce subsystem - APS Messages

:SOURce:DATA:TELecom:SONet:APSMessages:TOPology <discrete>

<discrete> =	LINear	Linear protection
	RING	Ring protection

Selects the type of protection topology.

The corresponding query Returns the selected protection topology in discrete short form.

:SOURce:DATA:TELecom:SONet:APSMessages:TOPology?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:APSMessages:REQuest <discrete>

<discrete> =	NREQuest	No Request (0000)
	DNRevert	Do Not Revert (0001)
	RREQuest	Reverse Request (0010)
	THRee	Not Used (0011)
	EXERcise	Exercise (0100)
	FIVE	Not Used (0101)
	LWTRestore	Wait To Restore (0110)
	SEVen	Not Used (0111)
	MSWitch	Manual Switch (1000)
	NINE	Not Used (1001)
	SDLPriority	Signal Degrade Low Priority (1010)
	SONetPriority	Signal Degrade High Priority (1011)
	SFLPriority	Signal Fail Low Priority (1100)
	SFHPriority	Signal Fail High Priority (1101)

FSWitch	Forced Switch (1110)
LOPRotection	Lockout Of Protection (1111)

Selects the transmitter SONET APS message to be transmitted (K1 Byte, Bits 1 to 4).

Only valid if :SOURce:DATA:TELecom:SONet:APSMessages:TOPology is set to LIN.

SONetPriority and SFHPriority are only valid when :SOURce:DATA:TELecom:SONet:APSMessages:ARCHitecture is set to OTN.

The corresponding query Returns the selected transmitter SONET APS message type in discrete form, as listed above.

:SOURce:DATA:TELecom:SONet:APSMessages:REQuest?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:APSMessages:CHANnel <numeric>

<numeric> =		
	0	NULL Channel
	1	Working Channel 1
	2	Working Channel 2
	3	Working Channel 3
	4	Working Channel 4
	5	Working Channel 5
	6	Working Channel 6
	7	Working Channel 7
	8	Working Channel 8
	9	Working Channel 9
	10	Working Channel 10
	11	Working Channel 11
	12	Working Channel 12
	13	Working Channel 13

14	Working Channel 14
15	Extra Traffic Channel

Selects the transmitter SONET APS message channel (K1 Byte, Bits 5 to 8).

Only valid if :SOURce:DATA:TELecom:SONet:APSMessages:TOPology is set to LIN.

Working Channels 1 to 14 are only valid if :SOURce:DATA:TELecom:SONet:APSMessages:ARCHitecture is set to OTN.

The corresponding query Returns the selected transmitter SONET APS message channel in numeric form, as listed above.

:SOURce:DATA:TELecom:SONet:APSMessages:CHANnel?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:APSMessages:BRIDge <numeric>

<numeric> = 0 to 15

Selects the SONET transmitter Linear APS message bridged channel (K2 Byte, Bits 1 to 4).

Only valid if :SOURce:DATA:TELecom:SONet:APSMessages:TOPology is set to LIN.

The corresponding query Returns the APS messages bridged channel as a numeric.

:SOURce:DATA:TELecom:SONet:APSMessages:BRIDge?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:APSMessages:ARCHitecture <discrete>

<discrete> =	OTONe	1+1
	OTN	1:N

Selects the SONET transmitter Linear APS architecture (K2 Byte, Bit 5).

Only valid if :SOURce:DATA:TELecom:SONet:APSMessages:TOPology is set to LIN.

The corresponding query returns the selected transmitter SONET APS message architecture in discrete form, as listed above.

:SOURce:DATA:TELecom:SONet:APSMessages:ARCHitecture?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:APSMessages:REServed <numeric>

<numeric> =	0	000
	1	001
	2	010
	3	011
	4	100
	5	101

Selects the SONET transmitter Linear APS messages reserved bits (K2 Byte, Bits 6 to 8) in numeric form.

Only valid if :SOURce:DATA:TELecom:SONet:APSMessages:TOPology is set to LIN.

The corresponding query Returns the selected transmitter SONET APS message reserved bits in numeric form.

:SOURce:DATA:TELecom:SONet:APSMessages:REServed?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:APSMessages:RCODe <discrete>

<discrete> =	NREQuest	No Request (0000)
	RRRing	Reverse Request - Ring (0001)
	RRSPan	Reverse Request - Stan (0010)
	ERINg	Exerciser - Ring (0011)
	ESPan	Exerciser - Stan (0100)
	RWTRestore	Wait to Restore (0101)
	MSRing	Manual Switch - Ring (0110)
	MSSPan	Manual Switch - Span (0111)
	SDRing	Signal Degrade - Ring (1000)
	SDSPan	Signal Degrade - Span (1001)
	SDPRotection	Signal Degrade - Protection (1010)
	SFRing	Signal Fail - Ring (1011)
	SFSPan	Signal Fail - Stan (1100)
	FSRing	Forced Switch Ring (1101)
	FSSPan	Forced Switch - Stan(1110)
	LOPRotection	Lockout Of Protection (1111)

Selects the transmitter Ring APS message to be transmitted (K1 Byte, Bits 1 to 4).

Only valid :SOURce:DATA:TELecom:SONet:APSMessages:TOPology is set to RING.

The corresponding query Returns the selected transmitter SONET APS message type in discrete short form.

:SOURce:DATA:TELecom:SONet:APSMessages:RCODe?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:APSMessages:DNODe <numeric>

<numeric> = 0 to 15

Selects the SONET transmitter Ring APS message destination node (K1 Byte, Bits 5 to 8).

Only valid if :SOURce:DATA:TELecom:SONet:APSMessages:TOPology is set to RING.

The corresponding query Returns the APS messages destination node as a numeric.

:SOURce:DATA:TELecom:SONet:APSMessages:DNODe?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:APSMessages:SNODe <numeric>

<numeric> = 0 to 15

Selects the SONET transmitter Ring APS message source node (K2 Byte, Bits 1 to 4) .

Only valid :SOURce:DATA:TELecom:SONet:APSMessages:TOPology is set to RING.

The corresponding query Returns the APS messages source node as a numeric in the range 0 to 15.

:SOURce:DATA:TELecom:SONet:APSMessages:SNODe?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:APSMessages:PCODe <discrete>

<discrete> =	SHORt	Short path
	LONG	Long path

Selects the SONET transmitter Ring APS message path type (K2 bit 5).

Only valid if
:SOURce:DATA:TELecom:SONet:APSMessages:TOPology is set to RING.

The corresponding query Returns the Ring APS messages path type in discrete short form.

:SOURce:DATA:TELecom:SONet:APSMessages:PCODe?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:APSMessages:SCODe <numeric>

<numeric> =	0	Idle (000)
	1	Bridged (001)
	2	Bridged & Switched (010)
	3	011
	4	100
	5	101

Selects the SONET transmitter Ring APS messages status code (K2 Byte, Bits 6 to 8).

Only valid
:SOURce:DATA:TELecom:SONet:APSMessages:TOPology is set to RING.

The corresponding query Returns the selected transmitter SONET APS message status code as a numeric in the range 1 to 5.

:SOURce:DATA:TELecom:SONet:APSMessages:SCODe?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:APSMessages:DOWNload

STart transmission of the SONET transmitter APS message.

SOURce subsystem - DCC Insertion

:SOURce:DATA:TELecom:SONet:IDCC <discrete>

<discrete> =	NONE	Turns both Off
	RDCC	Section DCC
	MDCC	Line DCC

Selects the Data Communication Channel Insert port for DCC Test functions.

The corresponding query returns the selected port in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:IDCC?

Returns: <discrete>

SENSe subsystem - Receiver SONET Settings

:SENSe:DATA:TELecom:SONet:RATE <discrete>

Controls the characteristics of the instrument's input ports.

<discrete> =	OC192	10Gb/s
	OC48	2.5Gb/s
	OC12	622Mb/s
	OC3	155Mb/s optical
	STS3	155Mb/s electrical
	OC1	52Mb/s optical
	STS1	52Mb/s electrical

Sets the output rate for the instrument input port.

The corresponding query returns the input port rate in discrete form as listed above.

:SENSe:DATA:TELecom:SONet:RATE?

Returns: <discrete>

SONET Mapping settings

:SENSe:DATA:TELecom:SONet:STS3 <numeric>

<numeric> =	1 to 64	STS-3 Number under test

Selects the STS-3 number under test. Only valid if :SENSe:DATA:TELecom:SONet:RATE is set a rate higher than STS3.

The corresponding query returns the test STS3 number.

:SENSe:DATA:TELecom:SONet:STS3?

Returns: <numeric>

SPE Layer Selection

:SENSe:DATA:TELecom:SONet:SPE:TYPE <discrete>

<discrete> = STS3C
STS1
STS12C
STS48C
STS192C

Set the SPE Mapping into an STS-N frame.

The corresponding query returns the SPE layer in discrete form as listed above.

:SENSe:DATA:TELecom:SONet:SPE:TYPE?

Returns: <discrete>

:SENSe:DATA:TELecom:SONet:STS1 <numeric>

<numeric> = 1 to 3 STS1 Number

Selects the SONET Receiver active STS-1 within the STS-3.

The corresponding query returns the active STS-1 in numeric form.

:SENSe:DATA:TELecom:SONet:STS1?

Returns: <numeric>

VT Layer Selection

:SENSe:DATA:TELecom:SONet:VT:TYPE <discrete>

<discrete> =	NONE
	VT2
	VT15

Selects the Receiver SONET tributary layer.

The corresponding query returns the tributary layer selected in discrete form as listed above.

:SENSe:DATA:TELecom:SONet:VT:TYPE?

Returns: <discrete>

Payload Layer Selection

:SENSe:DATA:TELecom:SONet:PAYLoad <discrete>

<discrete> =	BULK	Bulk Filled
	M140	140 Mb/s
	M34	34 Mb/s
	ASM2	Asynchronous 2Mb/s
	FLM2	2Mb/s floating Byte
	ASDS1	Asynchronous DS1
	FLDS1	DS1 Floating Byte
	DS3	DS3

Selects the Receiver SONET payload for single payload cases.

The corresponding query returns the payload in discrete form as listed above.

:SENSe:DATA:TELecom:SONet:PAYLoad?

Returns: <discrete>

:SENSe:DATA:TELecom:SONet:PRIMary:TS0 <boolean>

<discrete> =	0 or OFF	Data in TS0
	1 or ON	Signalling in TS0

Determines the content of TS0 as either Data or Signalling.

The corresponding query returns the TS0 state in discrete form as a boolean value.

:SENSe:DATA:TELecom:SONet:PRIMary:TS0?

Returns: <boolean>

VT Group

:SENSe:DATA:TELecom:SONet:VTG <numeric>

<numeric> = 1 to 7

Selects the SONET Receiver active VT Group within the selected STS-1.

The corresponding query returns the active VT Group in numeric form.

:SENSe:DATA:TELecom:SONet:VTG?

Returns: <numeric>

:SENSe:DATA:TELecom:SONet:VT <numeric>

<numeric> =	1 to 3	tributary number for VT-2
<numeric> =	1 to 4	tributary number for VT-1.5

Selects the SONET Receiver active VT within the selected VT Group

The corresponding query returns the active VT in numeric form.

:SENSe:DATA:TELecom:SONet:VT?

Returns: <numeric>

SENSe subsystem - Receiver SONET Test Function Commands

Lists the commands associated with the RECEIVE TEST FUNCTION display.

:SENSe:DATA:TELecom:SONet:OVERhead:CHANnel <numeric>

<discrete> =	1 to 64	STS3 number

Selects the channel from which the overhead bytes will be captured.

The corresponding query returns the channel selected as a numeric.

:SENSe:DATA:TELecom:SONet:OVERhead:CHANnel?

Returns: <numeric>

:SENSe:DATA:TELecom:SONet:DDCC <discrete>

<discrete> =	NONE	Turns both Off
	RDCC	Section Section DCC
	MDCC	Line Section DCC

Selects the Data Communications channel to be dropped via the DROP port, for DCC tests.

The corresponding query returns the selected DCC, in discrete form as listed above.

:SENSe:DATA:TELecom:SONet:DDCC?

Returns: <discrete>

SENSe subsystem - Data Capture Commands

The following commands are used to configure data capture for SONET. General commands for data capture are found in the Common Commands chapter.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:SONet:TRANsport <discrete>

<discrete> =	FRAMe	A1A2 Error
	CVS	CVS Error
	CVL	CVL Error
	REIL	REI-L Error

Selects SONET Transport Overhead error for triggering data capture.

The corresponding query returns the selected SONET TOH error in discrete form listed above.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:SONet:TRANsport?

Returns: <discrete>

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:SONet:PATH <discrete>

<discrete> =	CVP	CVP
	REIP	REI-P Error

Selects SONET Path Overhead error for triggering data capture.

The corresponding query returns the selected SONET POH error in discrete form listed above.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:SONet:PATH?

Returns: <discrete>

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:SONet:TRANsport <discrete>

<discrete> =	LOF	Loss of Frame
	SEF	Severely Errored Frame
	AISL	AIS-L
	RDIL	RDI-L
	PTAD	Pointer Activity
	K1K2	K1K2 Change

Selects SONET alarm for triggering Transport Overhead data capture.

The corresponding query returns the selected SONET TOH alarm in discrete form listed above.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:SONet:TRANsport?

Returns: <discrete>

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:SONet:PATH <discrete>

<discrete> =	RDIP	RDI-P
	PUNequipped	UNEQ-P

Selects SONET alarm for triggering Path Overhead data capture.

The corresponding query returns the selected SONET POH alarm in discrete form listed above.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:SONet:PATH?

Returns: <discrete>

SENSe subsystem - Receiver SONET Overhead Monitor Commands

:SENSe:DATA:TELecom:SONet:OCAPture:STS1 <numeric>

<numeric> = 1 to 3 STS-1 number

Selects the STS-1 Channel from which the overhead sequence will be captured.

The corresponding query returns the STS-1 channel number currently selected, in numeric form.

:SENSe:DATA:TELecom:SONet:OCAPture:STS1?

Returns: <numeric>

:SENSe:DATA:TELecom:SONet:OCAPture:STS3:SELect <numeric>

<numeric> = 1 to 64 STS-3 number

Selects the STS-3 Channel from which the overhead sequence will be captured.

The corresponding query returns the STS-3 channel number currently selected, in numeric form.

:SENSe:DATA:TELecom:SONet:OCAPture:STS3:SELect?

Returns: <numeric>

:SENSe:DATA:TELecom:SONet:OCAPture:OHBYte <discrete>

<discrete> = A1A2 | BNDA1A2 | E1 | F1 | D1D3 | K1K2 | H1 | D4D12 | S1 | M0 | M1 | J1 | E2 | C2 | G1 | F2 | H4 | F3 | K3 | N1 | H1H2 | H3
Xrc

Selects the overhead channel to be captured.

SENSe subsystem - Receiver SONET Overhead Monitor Commands

A byte/channel may also be selected by using an 'Xrc' notation where 'r' specifies the row of the required byte and 'c' specifies the column. For example, specifying 'X24' will select the 4th byte on the 2nd row of the specified STS-3 structure.

The corresponding query returns the selected overhead capture channel in discrete form as listed above.

:SENSe:DATA:TELecom:SONet:OCAPture:OHBYte?

Returns: <discrete>

:SENSe:DATA:TELecom:SONet:OCAPture:TRIGger:SELection <discrete>

<discrete> =	MANual	Manual Trigger
	PRE	Pre-Capture Trigger
	CENTered	Centered-Capture Trigger
	POST	Post-Capture Trigger

Selects the type of trigger for Overhead Capture.

When MANual trigger is selected, capture is started using the :SENSe:DATA:TELecom:SONet:OCAPture command. PRE-trigger capture will capture up to 255 elements before the trigger pattern. CENTered capture captures elements either side of the trigger pattern. POST capture captures up to 255 elements after the trigger pattern.

The corresponding query returns the selected overhead capture trigger selection in discrete form as listed above.

:SENSe:DATA:TELecom:SONet:OCAPture:TRIGger:SELection?

Returns: <discrete>

:SENSe:DATA:TELecom:SONet:OCAPture:TRIGger:POLarity <discrete>

<discrete> =	ON	Triggers when capture data MATCHES trigger pattern

ONNot	Triggers when capture data DOES NOT MATCH trigger pattern

Selects whether the trigger will start capture on data matching the trigger pattern or not matching the trigger pattern.

The corresponding query returns the selected trigger polarity.

:SENSe:DATA:TELecom:SONet:OCAPture:TRIGger:POLarity?

Returns: <discrete>

:SENSe:DATA:TELecom:SONet:OCAPture:TRIGger:PATTern <string>

<string> See Below

Sets the overhead capture trigger pattern as a string of hexadecimal digits. The number of hexadecimal characters is dependent on the overhead channel selected by **:SENSe:DATA:TELecom:SDH:OCAPture:OHBYte**. Two hexadecimal characters are required per byte, for example:

TCMACT - 1 byte "00" to "FF"

FAS - 6 bytes "000000000000" to "FFFFFFFFFFFF"

The corresponding query returns the current value of the trigger pattern in string form.

:SENSe:DATA:TELecom:SONet:OCAPture:TRIGger:PATTern?

Returns: <string> e.g.: "FF..FF"

:SENSe:DATA:TELecom:SONet:OCAPture:TRIGger:MASK <string>

<string> See Below

Sets the mask for the overhead capture trigger as a string of hexadecimal characters. Allows certain bits of

the trigger pattern to masked. The number of hexadecimal characters is dependent on the overhead channel selected by **:SENSe:DATA:TELecom:SDH:OCAPture:OHBYte**.

The corresponding query returns the trigger mask in string form.

:SENSe:DATA:TELecom:SONet:OCAPture:TRIGger:MASK?

Returns: <string>

:SENSe:DATA:TELecom:SONet:OCAPture <discrete>

<discrete> =	STOP	Stop current current
	STARt	Start new capture

Stops or starts overhead sequence capture.

The corresponding query returns the capture status in discrete form as listed above.

:SENSe:DATA:TELecom:SONet:OCAPture?

Returns: <discrete>

SENSe subsystem - Result Returning Commands

SONET Last second Results

:SENSe:DATA? <string>

<string> = **"ECOunt:SONet:LSECond:<error>"** <error> is one of the following

FRAMe"	Frame error count
CVS"	Section B1 BIP error count
CVL"	Line B2 BIP error count
REIL"	REI-L error count
CVP"	Path B3 BIP error count
REIP"	REI-P error count
CVIec	CV-IEC error count
TRIB:CVV	VT Path BIP errr count
TRIB:REIV	VT FEBE error count

<string> = **"ERATio:SONet:LSECond:<error>"** <error> is one of the following

FRAMe"	Frame error ratio
CVS"	Section B1 BIP error ratio
CVL"	Line B2 BIP error ratio
REIL"	REI-L error ratio
CVP"	Path B3 BIP error ratio
REIP"	REI-P error ratio
CVIec	CV-IEC error ratio
TRIB:CVV	VT Path BIP errr ratio
TRIB:REIV	VT FEBE error ratio

Returns: <numeric>

SONET Total Results

:SENSe:DATA? <string>

<string> = **"ECOunt:SONet:<error>"** <error> is one of the following

FRAMe"	Frame error count
CVS"	Section B1 BIP error count
CVL"	Line B2 BIP error count
REIL"	REI-L error count
CVP"	Path B3 BIP error count
REIP"	REI-P error count
CVIec	CV-IEC error count
TRIB:CVV	VT Path BIP errr count
TRIB:REIV	VT FEBE error count

<string> = **"ERATio:SONet:<error>"** <error> is one of the following

FRAMe"	Frame error ratio
CVS"	Section B1 BIP error ratio
CVL"	Line B2 BIP error ratio
REIL"	REI- error ratio
CVP"	Path B3 BIP error ratio
REIP"	REI-P error ratio
CVIec	CV-IEC error ratio
TRIB:CVV	VT Path BIP errr ratio
TRIB:REIV	VT FEBE error ratio

Returns: <numeric>

SONET G.828 Analysis Results

:SENSe:DATA? <string>

<string> = **"<Result type>:SONet:<Path Type>:G828"**

<Result type> is one of the following

ESEConds	Error Seconds
SESeconds	Severely Errored Seconds
SEPeriod	Severely Errored Period
EBCount	Errored block count
BBECount	Background block error count
ESRatio	Error Second Ratio
SESRatio	Severely Errored Second Ratio
SEPI	Severely Errored Period Intensity
BBERatio	Background Block Error ratio
UASeconds	Unavailable seconds
PUASeconds	Path Unavailable seconds

<Path type> is one of the following

CVS	RSOH B1 block errors
CVL	MSOH B2 block errors
REIL	MSOH REI block errors
CVP	HO Path B3 block errors
REIP	HO Path REI block errors
CV-IEC	LO Path IEC block errors
CV-V	VT path BIP block errors
REI-V	VT path FEBE block errors

Returns: <numeric>

SONET G.826 Analysis Results

:SENSe:DATA? <string>

<string> = **"<Result type>:SONet:<Path Type>:G826"**

<Result type> is one of the following

ESEConds	Error Seconds
SESeconds	Severely Errored Seconds
EBCount	Errored block count
BBECount	Background block error count
ESRatio	Error Second Ratio
SESRatio	Severely Errored Second Ratio
BBERatio	Background Block Error ratio
UASeconds	Unavailable seconds
PUASeconds	Path Unavailable seconds

<Path type> is one of the following

CVS	RSOH B1 block errors
CVL	MSOH B2 block errors
REIL	MSOH REI block errors
CVP	HO Path B3 block errors
REIP	HO Path REI block errors
CV-IEC	LO Path IEC block errors
CV-V	VT path BIP block errors
REI-V	VT path FEBE block errors

Returns: <numeric>

SONET Optical Power Result

:SENSe:DATA? <string>

<string> = "OPOWer:SONet" Optical power (dBm)

Returns: <numeric>

SONET Pointer Activity Results

:SENSe:DATA? <string>

<string> = **"PACTivity:SONet:<type>"** where <type> is one of the following

PVALue	SPE Pointer value
NDFSeconds	SPE Pointer NDF seconds
MNDFseconds	SPE Pointer MNDF seconds
PCOunt	SPE Pointer +ve Adj Count
PSEConds	SPE Pointer +veAdj Seconds
NCOunt	SPE Pointer -ve Adj Count
NSEConds	SPE Pointer -ve Adj Seconds
IOFFset	Implied SPE Offset
VT:PVALue	VT Pointer value
VT:NDFSeconds	VT Pointer NDF seconds
VT:MNDFseconds	VT Pointer MNDF seconds
VT:PCOunt	VT Pointer +ve Adj Count
VT:PSEConds	VT Pointer +veAdj Seconds
VT:NCOunt	VT Pointer -ve Adj Count
VT:NSEConds	VT Pointer -ve Adj Seconds
VT:IOFFset	Implied VT Offset

Returns: <numeric>

SONET Alarm Seconds Results

:SENSe:DATA? <string>

<string> = **"ASEConds:SONet:<alarm>"** where <alarm> is one of the following

LOF	Loss Of Frame
SEF	Severely Errored Frame Defect
LOPP	Loss Of Pointer (LOP-P)
AISL	Line AIS (AIS-L)
AISP	Path AIS (AIS-P)
RDIL	Line FERF (RDI-L)
RDIP	Path FERF (RDI-P)
K1K2	K1K2 byte change
PUNeq	Path Unequipped
VT:LOPV	VT Loss of Pointer (LOP-V)
VT:AISV	VT Path AIS (AIS-V)
VT:RDIV	VT Path FERF (RDI-V)
VT:P1P0	P1P0 frame Synchronization loss
VT:OPSL	Overhead Pattern Sync Loss

Returns: <numeric>

FETCh subsystem

The FETCh subsystem is used to retrieve data directly accumulated by the instrument.

SONET Data Capture

:FETCh:ARRay:DATA:TELecom:SONet:DCAPture:DATA? <numeric>,<numeric>,<numeric>

<numeric> = Frame Index.

<numeric> = STS-3 Number (Min = 1, Max = 64)

<numeric> = STS-1 Number (Min = 1, Max = 3)

Returns: <numeric>, <numeric>,...<numeric>

Returns comma separated byte values for the specified columns of the selected STS-3. A STS-1 value of 1 will return the byte values for columns 1, 4 and 7 of the selected STS-3; a value of 2 will return the byte values for columns 2, 5 and 8 of the selected STS-3; while a value of 3 will return columns 3, 6 and 9 of the selected STS-3.

For example, if the STS-1 value is 2 for a specified STS-3, the bytes are returned as follows:

<col(2), row(1)>, <col(2), row(2)>, <col(2), row(3)>,…
<col(2), row(9)>, <col(5), row(1)>, <col(5), row(2)>,
<col(5), row(3)>,… <col(5), row(9)>, <col(8), row(1)>,
<col(8), row(2)>, <col(8), row(3)>,… <col(8), row(9)>

:FETCh:ARRay:DATA:TELecom:SONet:DCAPture:PDATa? <numeric>

<numeric> = Frame Index.

Returns: <numeric>, <numeric>,...<numeric>

Returns the byte values of the Path Overhead from the specified frame.

:FETCh:SCALar:DATA:TELecom:SONet:DCAPture:DATA?
<numeric>,<numeric>,<numeric>,<discrete>

<numeric> =	Frame Index.
<numeric> =	STS-3 Number (Min = 1, Max = 64)
<numeric> =	STS-1 Number (Min = 1, Max = 3)
<discrete> =	Transport Overhead Byte Name

Returns: <numeric>

Returns the value of a specific Transport Overhead byte within the STS-1 frame.

:FETCh:SCALar:DATA:TELecom:SONet:DCAPture:PDATa?
<numeric>,<discrete>

<numeric> =	Frame Index.
<discrete> =	Path Overhead Byte Name

Returns: <numeric>

Returns the value of a specific Path Overhead byte in a captured frame.

SONET Overhead Bytes

:FETCh:ARRay:DATA:TELecom:SONet:OVERhead:DATA <numeric>?

<numeric> = 1 to 3 STS-1 group

The parameter identifies a set of columns within the selected STS-3. A Value of 1 selects columns 1,4 & 7, a value of 2 selects Columns 2,5 & 8, and a value of 3 selects Columns 3,6 & 9.

Returns the value of the selected section overhead as a comma seperated list of 27 integer numerical values in the range 0 to 255.

Returns: <numeric>, <numeric>,.....<numeric>

The values are arranged as shown

<row1 col1>,<row1 col2>,<row1 col3>.. ..<row1 col9>
<row2 col1>,<row2 col2>,<row2 col3>.. ..<row2 col9>
<row3 col1>.....
....<row8 col9>
<row9 col1>,<row9 col2>,<row9 col3>.. ..<row9 col9>

The channel to be monitored is identified by the command **:SENSe:DATA:TELecom:SONet:OVERhead:CHANnel**.

:FETCh:ARRay:DATA:TELecom:SONet:POVerhead:DATA?

Returns the value of the high order path overhead bytes as an array of 9 numeric values. Each numeric is in the range 0 to 255.

Returns: <numeric>, <numeric>,.....<numeric>

:FETCh:ARRay:DATA:TELecom:SONet:VT:POVerhead:DATA?

Returns the value of the low order path overhead bytes as an array of 9 numeric values. Each numeric is in the range 0 to 255.

Returns: <numeric>, <numeric>,.....<numeric>

:FETCh:SCALar:DATA:TELecom:SONet:OVERhead:DATA <numeric>, <discrete>?

<numeric> = 1 to 3 Column Number

<discrete> = A1 | A2 | J0/Z0 | E1 | F1 | D1 | D2 | D3 | H1 | H2 | H3 | K1 | K2 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | S1/Z1 | M0/M1 | Z2 | E2 | B1 | B2 | X11 | X12 | X13 | X21 | X22 | X23 | X31 | X32 | X33 | X41 | X42 | X43 | X51 | X52 | X53 | X61 | X62 | X63 | X71 | X72 | X73 | X81 | X82 | X83 | X91 | X92 | X93 |

Returns: <numeric>

Returns the value of a single named byte of the selected transmitter section overhead. The required byte is specified by 2 command parameters.

The first parameter identifies a set of columns within the selected STS-1. A Value of 1 selects columns 1,4 & 7, a value of 2 selects Columns 2,5 & 8, and a value of 3 selects Columns 3,6 & 9. For the SPE-0 signal rate only 1 is valid.

The second parameter identifies the specific byte in the selected set of columns. There are two ways of specifying this byte. The first is to use standard names where these are valid. The set of valid names is shown in the table above. The second method is to use an "Xrc" notation, where r is the numerical value of the bytes row in the transport overhead and c is the numerical value of the bytes column in the transport overhead.

This method allows access to ANY byte in the selected STM-1 / Column set.

:FETCh:SCALar:DATA:TELecom:SONet:POVerhead:DATA <discrete>?

<discrete>= C2 | G1 | F2 | H4 | Z3 | Z4 | N1 | J1 | B3

Returns: <numeric>

Returns the value of a single named byte of the foreground high order path overhead byte.

:FETCh:SCALar:DATA:TELecom:SONet:VT:POVerhead:DATA <discrete>?

<discrete>= C2 | G1 | F2 | H4 | Z3 | Z4 | N1 | J1 | B3

Returns: <numeric>

Returns the value of a single named byte of the foreground low order path overhead byte.

SONET Labelled Overhead Bytes

:FETCh:SCALar:DATA:TELecom:SONet:OVERhead:K1?

Returns: <numeric>

Returns the value of the K1 APS signalling overhead byte.

:FETCh:SCALar:DATA:TELecom:SONet:OVERhead:K2?

Returns: <numeric>

Returns the value of the K2 APS signalling overhead byte.

:FETCh:SCALar:DATA:TELecom:SONet:OVERhead:S1?

Returns: <numeric>

Returns the value of the S1 Synchronisation Status overhead byte.

SONET Overhead Trace Messages

:FETCh:ARRay:DATA:TELecom:SONet:J0?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the STS-N regenerator overhead J0 byte as a comma seperated list of integer numericvalues. Each number is in the range 0 to 255. There is no block header.

:FETCh:STRing:DATA:TELecom:SONet:J0?

Returns: <string>

Returns the value of the section overhead J0 byte as a 64 ASCII character string if CRC7 is not detected, 15 ASCII character string if CRC7 is detected. If the string contains any non printing characters then ~ is substituted.

:FETCh:ARRay:DATA:TELecom:SONet:J1?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the high order J1 path trace byte as a comma seperated list of 64 numbers if CRC7 is not detected, 15 numbers if CRC7 is detected. Each number is in the range 0 to 255. There is no block header

:FETCh:STRing:DATA:TELecom:SONet:J1?

Returns: <string>

Returns the value of the high order J1 path trace byte as a, 64 ASCII character string if CRC7 is not detected, 15 ASCII character string if CRC7 is detected. If the string contains any non printing characters then ~ is substituted.

:FETCh:ARRay:DATA:TELecom:SONet:VT:J1?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the low order J1 path trace byte as a comma seperated list of 64 numbers if CRC7 is not detected, 15 numbers if CRC7 is detected. Each number is in the range 0 to 255. There is no block header

:FETCh:STRing:DATA:TELecom:SONet:VT:J1?

Returns: <string>

Returns the value of the low order J1 path trace byte as a, 64 ASCII character string if CRC7 is not detected, 15 ASCII character string if CRC7 is detected. If the string contains any non printing characters then ~ is substituted.

:FETCh:ARRay:DATA:TELecom:SONet:VT:J2?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the low order J2 path trace byte as a comma seperated list of 15 numbers. Each number is in the range 0 to 255. There is no block header

:FETCh:STRing:DATA:TELecom:SONet:VT:J2?

Returns: <string>

Returns the value of the low order J2 path trace byte as a 15 ASCII character string. If the string contains any non printing characters then ~ is substituted.

SONET Overhead Sequence Capture Commands

:FETCh:SCALar:DATA:TELecom:SONet:OCAPture:MINelement?

Returns: <numeric>

Returns the minimum element index of the captured sequence.

:FETCh:SCALar:DATA:TELecom:SONet:OCAPture:MAXelement?

Returns: <numeric>

Returns the maximum element index of the captured sequence.

:FETCh:SCALar:DATA:TELecom:SONet:OCAPture:FCOunt? <numeric>

<numeric> = Element Index

Returns: <numeric>

Returns the capture repeat count of the specified element in numeric form. Individual elements may be captured up to 65535 times before a new element is entered into the captured sequence.

The sequence element index (numeric parameter) can be in the range -255 to +255 depending on the trigger selection.

The element which triggered sequence capture (the element that met the trigger criteria) is specified by index 0. Since 256 elements may be captured, pre-trigger can capture elements indexed -255 to 0 whilst post-trigger capture can capture elements indexed 0 to +255.

:FETCh:STRing:DATA:TELecom:SONet:OCAPture:DATA? <numeric>

<numeric> = Element Index.

Returns: <string>

Returns the capture data of the specified element in string form. The data is represented by hexadecimal characters. The number of characters depends on the selected capture channel.

:FETCh:ARRay:DATA:TELecom:SONet:OCAPture? <numeric>

<numeric> = Number of elements to return.

Returns: <array>

Returns an array with the number of entries determined by <numeric> and seperated by CR/LF.

Each entry consists of an alphanumeric string and a numeric seperated by commas. The alphanumeric string provides the hexadecimal value of the captured data. The length of the string depends upon the overhead channel selected for capture, two hexadecimal characters/overhead byte. The numeric indicates indicates the number of frames for which the captured data existed. If this command is issued when a capture is being performed, some entries will contain no data. In this case 9.91E+37 is returned.

SYSTem Subsystem - SONET Trigger Output Commands

:SYSTem:TRIGger:RECeive:ERRor:SONet:TRANsport <discrete>

<discrete> =	FRAMe	A1A2 Error
	CVS	CVS Error
	CVL	CVL Error
	REIL	REI-L Error

Selects SONET Transport Overhead error for trigger output when :SYSTem:TRIGger:RECeive:ERRor:STANdard is set to TOH.

The corresponding query returns the selected SONET TOH error in discrete form listed above.

:SYSTem:TRIGger:RECeive:ERRor:SONet:TRANsport?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ERRor:SONet:PATH <discrete>

<discrete> =	CVP	CVP
	REIP	REI-P Error

Selects SONET Path Overhead error for trigger output when :SYSTem:TRIGger:RECeive:ERRor:STANdard is set to POH.

The corresponding query returns the selected SONET POH error in discrete form listed above.

:SYSTem:TRIGger:RECeive:ERRor:SONet:PATH?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ALARm:SONet:TRANsport <discrete>

<discrete> =	LOF	Loss of Frame
	SEF	Severely Errored Frame
	AISL	AIS-L
	RDIL	RDI-L
	PTAD	Pointer Activity
	K1K2	K1K2 Change

Selects SONET Transport Overhead alarm for trigger output when :SYSTem:TRIGger:RECeive:ALARm:STANdard is set to TOH.

The corresponding query returns the selected SONET TOH alarm in discrete form listed above.

:SYSTem:TRIGger:RECeive:ALARm:SONet:TRANsport?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ALARm:SONet:PATH <discrete>

<discrete> =	AISP	AIS-P
	AISC	AIS-C
	RDIP	RDI-P
	LOPP	LOP-P
	LOPC	LOP-C
	PUNequipped	UNEQ-P

Selects SONET Path Overhead alarm for trigger output when :SYSTem:TRIGger:RECeive:ALARm:STANdard is set to POH.

The corresponding query returns the selected SONET POH alarm in discrete form listed above.

:SYSTem:TRIGger:RECeive:ALARm:SONet:PATH?

Returns: <discrete>

6

UNFRamed SCPI Command Reference

SOURce subsystem - Transmitter UNFRamed Settings Commands, see page, 6-3
SOURce subsystem - Transmitter Error Test Function Commands, see page, 6-4
SOURce subsystem - Frequency Offset Test Function, see page, 6-7
SENSe subsystem - Receiver UNFRamed Settings Commands, see page, 6-8

Unframed Command Reference

Unframed Command Reference

This chapter contains detailed information on the SCPI (Standard Commands for Programming Instruments) and IEEE 488.2 common commands you will use when writing programs to control your Instrument for Unframed operation.

Please also refer to chapter 2 Common Commands for general information on SCPI command formats and for a list of commands

SOURce subsystem - Transmitter UNFRamed Settings Commands

:SOURce:DATA:TELecom:UNFRamed:RATE <discrete>

<discrete> =	F10G7	10.71Gb/s
	F10G	9.95Gb/s
	F2G5	2.48Gb/s
	F622M	622.08Mb/s
	F155M	155.52Mb/s
	F52M	51.84Mb/s

Sets the output rate for the instrument input port.

The corresponding query returns the rate selected in discrete form as listed above.

:SOURce:DATA:TELecom:UNFRamed:RATE?

Returns: <discrete>

SOURce subsystem - Transmitter Error Test Function Commands

:SOURce:DATA:TELecom:UNFRamed:ERRor:GROup <discrete>

<discrete> = PATTern Pattern Errors

Selects UNFRamed transmit test function Error Group. Further selection of :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete> is required. Selection of PAYLoad results in BIT error type being selected.

The corresponding query returns the Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:UNFRamed:ERRor:GROup?

Returns: <discrete>

:SOURce:DATA:TELecom:UNFRamed:ERRor:PATTern <discrete>

<discrete> = BIT

Selects Pattern Error Type to generate. Further selection of :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete> is required.

The corresponding query returns the Pattern Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:UNFRamed:ERRor:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:ERRor:SINGle

Injects a single error.

There is no corresponding query.

:SOURce:DATA:TELecom:UNFRamed:ERRor:RATE <discrete>

<discrete> =	NONE	Errors Off
	E_3	
	E_4	
	E_5	
	E_6	
	E_7	
	E_8	
	E_9	
	USER	User defined error rate

Selects the transmitter Error Rate of the error type selected by the Error Group Selection Functons.

The corresponding query returns the selected transmitter Error Rate in discrete form, as listed above.

Note — If this query returns USER, then :SOURce:DATA:TELecom:SDH:ERRor:RATE:USER? must be used to discover the currently injected error rate.

:SOURce:DATA:TELecom:UNFRamed:ERRor:RATE?

Returns: <discrete>

:SOURce:DATA:TELecom:UNFRamed:ERRor:RATE:USER <numeric>

<numeric>=	9.9E-9 to 1.1E-3	mantissa resolution 0.1, exponent resolution 1

Sets the user defined Error Add rate.
:SOURce:DATA:TELecom:SDH:ERRor:RATE must be set to USER

Note — The maximum user defined error rate is dependent on both error type and line rate.

The corresponding query returns the User Error Rate as a numeric.

:SOURce:DATA:TELecom:UNFRamed:ERRor:RATE:USER?

Returns: <numeric>

:SOURce:DATA:TELecom:UNFRamed:ERRor:RATE:USER:ACTion <boolean>

<boolean>= 0 or OFF
1 or ON User Value set as Error Rate

Sets the user defined Error Add rate specified by :SOURce:DATA:TELecom:UNFRamed:ERRor:RATE:USER.The corresponding query returns the boolean state of the User Rate.

:SOURce:DATA:TELecom:UNFRamed:ERRor:RATE:USER:ACTion?

Returns: <boolean>

SOURce subsystem - Frequency Offset Test Function

:SOURce:CLOCk:UNFRamed:FOFFset <boolean>

<boolean> = 0 or OFF
1 or ON

Enables or disables the Clock Frequency Offset. The amount of Offset is set using :SOURce:CLOCk:UNFRamed:FOFFset:OFFSet.

The corresponding query returns the Clock Frequency Offset active state as 0 or 1.

:SOURce:CLOCk:UNFRamed:FOFFset?

Returns: <boolean>

:SOURce:CLOCk:UNFRamed:FOFFset:OFFSet <numeric>

<numeric> = -90.00 to +90.00 ppm for all rates

Sets the amount of Clock Frequency Offset when Frequency Offset is enabled by setting :SOURce:CLOCk:UNFRamed:FOFFset to ON.

The corresponding query returns the amount of Clock Frequency Offset in parts per million.

:SOURce:CLOCk:UNFRamed:FOFFset:OFFSet?

Returns: <numeric>

SENSe subsystem - Receiver UNFRamed Settings Commands

:SENSe:DATA:TELecom:UNFRamed:RATE <discrete>

<discrete> =	F10G7	10.71Gb/s
	F10G	9.95Gb/s
	F2G5	2.48Gb/s
	F622M	622.08Mb/s
	F155M	155.52Mb/s
	F52M	51.84Mb/s

Sets the input rate for the instrument input port.

The corresponding query returns the rate selected in discrete form as listed above.

:SENSe:DATA:TELecom:UNFRamed:RATE?

Returns: <discrete>

7

Status Reporting

Status Reporting

The status reporting capability of the Instrument is provided by the STATus subsystem, its Status Registers and the Status Byte.

Table 7-1 Status Registers

The following status registers are provided and conform to IEEE 488.2:

Status Register	Description
Standard Event	This register is accessed using the command *ESR?
QUEStionable	Defined by SCPI.
OPERation	Defined by SCPI.
INSTrument	Monitors general instrument status.
DATA	Monitors specific instrument status.
Various	A number of status registers offering specific status monitoring capability.

General Status Register

The status registers conform to IEEE 488.2 and each comprises four registers as shown in Figure 7-1. For the commands which access and control these registers, see "STATus subsystem" on page **STATus subsystem** 2-34.

Figure 7-1 General Status Register

Condition Register Monitors the defined Status conditions. There is no latching of conditions in this register, it is updated in real time.

Transition Filter Determines whether positive or negative transitions (true or false) in the Condition Register set the Event Register.

Event Register Latches the transient states that occur in the Condition Register as specified by the Transition Filter.

Event Enable Register Masks the Event register, determining which of its bits set the summary bit in the Status Byte.

Status Byte

*STB? or a serial port - Returns the value of the Status Byte in numeric form.

*SRE <numeric> - Sets the Status Byte mask.

*SRE? - Returns the current mask setting in numeric form.

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
OPER	RQS	ESR	MAV	QUES	-	-	-

DB0 - DB2 Not used, always read as 0.

DB3 QUES - QUEStionable Status register summary . Indicates that a bit has been set in the QUEStionable Status register.

DB4 MAV - Message Available. Remains set until err output messages are read from the Instrument.

DB5 ESR - Event Status register summary . Indicates that a bit has been set in the Event Status register.

DB6 RQS - Request Service. Set when en SRQ is generated for whatever reason. Cleared by SPOLL or *STB?

DB7 OPER - OPERation Status register summary . Indicates that a bit has been set in the OPERation Status register

Standard Event Status Register

*ESR? - Returns the Standard Event Status Register value in numeric form.

*ESE <numeric> - Sets the event enable register mask.

*ESE? - Returns the current mask setting.

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
PWR	URQ	CME	EXE	DDE	QUE	RQC	OPC

DB0 OPC - OPERation Complete
DB1 RQC - Request Control.
DB2 QUE - Query Error
DB3 DDE - Device Dependent Error.
DB4 EXE - Execution Error.
DB5 CME - Command Error.
DB6 URQ - User Request.
DB7 PWR - Power On.

QUEStionable Status Register

Provides a summary of the DATA Status register.

For related commands, see "STATus subsystem" on page 2-34

Example: STATus:QUEStionable:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	CMW	-	-	-	-	DATA	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	-	-

DB0-8 Not used, always read as 0

DB9 DATA - DATA Status register summary .

DB10-13 Not used, always read as 0.

DB14 CMW - Command Warning

DB15 Not used, always reads as 0

OPERation Status Register

Provides a summary of the INSTrument Status register, and reports when a measurement is being made.

For related commands, see "STATus subsystem" on page 2-34

Example: STATus:OPERation:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	INST	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	MEAS	-	-	-	-

DB0-3 Not used, always reads as 0

DB4 MEAS - Measuring. Currently making a measurement

DB5-12 Not used, always read as 0.

DB13 INST - INSTrument Status register summary .

DB14-15 Not used, always read as 0.

INSTrument Status Register

Reports the instrument Status.

For related commands, see "STATus subsystem" on page 2-34

Example: STATus:INSTrument:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
	STP	STC	-	-	EOT	LQE	-

DB0 Reserved.
DB1 Reserved
DB2 EOT - End Of Test period.
DB3 Not used, always read as 0
DB4 Not used, always read as 0.
DB5 STC - Self Test complete.
DB6 STP - Last second period complete.
DB7 Reserved
DB8-15 Not used, always read as 0.

DATA Status Register

Summarizes the alarm Status registers shown. In addition provides a Power Failed alarm indication.

For related commands, see "STATus subsystem" on page 2-34

Example: STATus:DATA:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	ISUM	-	OTNS	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	SPDH	-	-	SSUM	-	-

DB0 Not used, always read as 0.
DB1 Reserved
DB2 SSUM - SDH / SONET Status register summary
DB3 Not used, always read as 0.
DB4 Reserved.
DB5 SPDH - SPDH Status register summary
DB6 Reserved.
DB7-9 Not used, always read as 0.
DB10 Not used, always read as 0.
DB11 Reserved
DB12 OTNS – OTN Status Register Summary
DB13 Not used, always read as 0
DB14 ISUM - ISUM Status register summary
DB15 Not used, always read as 0

ISUMmary Status Register

Provides summarized alarm indications for each of the conditions, shown below, derived from the front panel bi-color LEDs. Use this register to determine the Status of the instrument independent of its configuration.

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	ERR	PSL	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-				FRM	LOS	PLO

DB0 PLO - Power Loss.
DB1 LOS - Loss of Signal
DB2 FRM - Frame Alarm (LOF / OOF)
DB3 Reserved
DB4 Reserved
DB5 Reserved
DB6 Not used, always read as 0.
DB7 Reserved
DB8 Reserved
DB9 Not used, always read as 0.
DB10 Not used, always read as 0.
DB11 Not used, always read as 0.
DB12 Not used, always read as 0.
DB13 PSL - Pattern sync loss
DB14 ERR - Errors detected
DB15 Not used, always read as 0.

SSUMmary Status Register

Provides summary alarm indications related to the SDH/SONET Signal .

For related commands, see "STATus subsystem" on page 2-34

Example: STATus:SSUMmary:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	SDH4/ SON4	SDH3/ SON4	SDH2/ SON2	SDH/ SON

DB0 SDH/SON - SDH Status register summary.

DB1 SDH2/SON2 - SDH2/SON2 Status register summary.

DB2 SDH3/SON3 - SDH3/SON3 Status register summary.

DB3 SDH4/SON4 - SDH4/SON4 Status register summary.

DB4 Not used, always read as 0.

DB5 Not used, always read as 0.

DB6 Not used, always read as 0.

DB7 Not used, always read as 0.

DB8 Not used, always read as 0.

DB9 Not used, always read as 0.

DB10 Not used, always read as 0.

DB11 Not used, always read as 0.

DB12 Not used, always read as 0.

DB13 Not used, always read as 0.

DB14 Not used, always read as 0.

DB15 Not used, always read as 0.

SDH Status Register

Provides primary alarm indications related to the SDH Signal .

For related commands, see "STATus subsystem" on page 2-34

Example: STATus:SDH:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	LPRDI	TUAIS	TULOP	HPRDI	MSRDI	H4

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
CSL	-	AUAIS	MSAIS	LOP	OOF	LOF	-

DB0 Reserved.
DB1 LOF - Loss Of Frame
DB2 OOF - Out Of Frame
DB3 LOP - Loss Of Pointer
DB4 MSAIS - Multiplexer Section AIS
DB5 AUAIS - AU AIS.
DB6 Reserved.
DB7 CSL - Clock Synchronization Loss
DB8 H4 - H4 LOM
DB9 MSRDI - Multiplexer Section RDI.
DB10 HPRDI - High Order Path RDI.
DB11 TULOP - Tributary Loss Of Pointer
DB12 TUAIS - Tributary Path AIS
DB13 LPRDI - Low Order Path RDI.
DB14 Reserved.
DB15 Not used, always read as 0.

SDH2 Status Register

Provides miscellaneous SDH monitoring.

For related commands, see "STATus subsystem" on page 2-34

Example:

```
STATus:SDH2:EVENt?
```

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-			-	FMU

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
SIGW	K1K2	TMNDF	TNDF	TPADJ	MNDF	NDF	PADJ

DB0 PADJ - AU Pointer Adjust.
DB1 NDF - AU Pointer New Data Flag.
DB2 MNDF - AU Pointer Missing New Data Flag.
DB3 TPADJ - TU Pointer Adjust.
DB4 TNDF - TU Pointer New Data Flag.
DB5 TMNDF - TU Pointer Missing New Data Flag.
DB6 K1K2 - K1K2 change.
DB7 SIGW - Signal Wizard in Progress
DB8 FMU - Frequency Measurement Updated.
DB9 Reserved
DB10 Reserved.
DB11 Reserved.
DB12 Reserved.
DB13 Not used, always read as 0.
DB14 Not used, always read as 0.
DB15 Not used, always read as 0.

SDH3 Status Register

Provides SDH TCM monitoring.

For related commands, see "STATus subsystem" on page 2-34

Example:

```
STATus:SDH3:EVENt?
```

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	VCAIS	TCUNEQ	TCODI	TCRDI	TCIAIS	TCLOM	P1P0

DB0 P1P0 LOM.
DB1 TCLOM - TCM Loss of Multiframe.
DB2 TCIAIS - TCM Incoming AIS.
DB3 TCRDI - TCM Remote Defect Indication.
DB4 TCODI - TCM Outgoing Defect Indication.
DB5 TCUNEQ - TCM Unequipped.
DB6 VCAIS - VC-AIS.
DB7 Not used, always read as 0.
DB8 Reserved
DB9 Reserved
DB10 Reserved
DB11 Reserved
DB12 Reserved
DB13 Reserved
DB14 Reserved
DB15 Not used, always read as 0.

SDH4 Status Register

Provides miscellaneous SDH monitoring.

For related commands, see "STATus subsystem" on page 2-34

Example:

```
STATus:SDH4:EVENt?
```

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	LOPC	AISC	HPRDIC	HPRDIS	HPRDIP	HPUNEQ

DB0 HPUNEQ - High Order Path Unequipped.
DB1 HPRDIP - High Order Enhanced RDI-P
DB2 HPRDIS - High Order Enhanced RDI-S
DB3 HPRDIC - High Order Enhanced RDI-C
DB4 AISC - Concatenated AIS
DB5 LOPC - Concatenated LOP
DB6 Reserved
DB7 Reserved
DB8 Reserved
DB9 Reserved
DB10 Not used, always read as 0.
DB11 Not used, always read as 0.
DB12 Not used, always read as 0.
DB13 Not used, always read as 0.
DB14 Not used, always read as 0.
DB15 Not used, always read as 0.

SONet Status Register

Provides primary alarm indications related to the SONET Signal .

For related commands, see "STATus subsystem" on page 2-34

Example: STATus:SONet:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	RDIV	AISV	LOPV	RDIP	RDIL	H4

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
CSL	-	AISP	AISL	LOPP	SEF	LOF	-

DB0 Reserved.
DB1 LOF - Loss Of Frame
DB2 SEF - Severely Errored Frame Defect
DB3 LOPP - Loss Of Pointer (LOP-P).
DB4 AISL - Line AIS (AIS-L)
DB5 AISP - Path AIS (AIS-P).
DB6 Reserved.
DB7 CSL - Clock Synchronization Loss
DB8 H4 - H4 LOM
DB9 RDIL - Line FERF (RDI-L).
DB10 RDIP - Path FERF (RDI-P).
DB11 LOPV - VT Loss Of Pointer (LOP-V).
DB12 AISV - VT Path AIS (AIS-V).
DB13 RDIV - VT Path FERF. (RDI-V).
DB14 Reserved
DB15 Not used, always read as 0

SON2 Status Register

Provides miscellaneous SONET monitoring.

For related commands, see "STATus subsystem" on page 2-34

Example: STATus:SONet2:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-				FMU

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
ALSC	K1K2	TMNDF	TNDF	TPADJ	MNDF	NDF	PADJ

DB0 PADJ - SPE Pointer Adjust.
DB1 NDF - SPE Pointer New Data Flag
DB2 MNDF - SPE Pointer Missing New Data Flag
DB3 TPADJ - VT Pointer Adjust
DB4 TNDF - VT Pointer New Data Flag
DB5 TMNDF - VT Pointer Missing New Data Flag.
DB6 K1K2 - K1K2 change
DB7 ALSC – SDH Alarm/Trib scan in progress
DB8 FMU - Frequency Measurement Updated.
DB9 Reserved
DB10 Reserved
DB11 Reserved
DB12 Reserved
DB13 Reserved
DB14 Reserved
DB15 Not used, always read as 0

SON3 Status Register

Provides miscellaneous SONET monitoring.

For related commands, see "STATus subsystem" on page 2-34

Example:

```
STATus:SONet3:EVENt?
```

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	-	P1P0

DB0 P1P0 LOM.
DB1 Reserved
DB2 Reserved
DB3 Reserved
DB4 Reserved
DB5 Reserved
DB6 Reserved
DB7 Not used, always read as 0.
DB8 Reserved.
DB9 Reserved
DB10 Reserved
DB11 Reserved
DB12 Reserved
DB13 Reserved
DB14 Reserved
DB15 Not used, always read as 0.

SON4 Status Register

Provides miscellaneous SONET monitoring.

For related commands, see "STATus subsystem" on page 2-34

Example:

```
STATus:SONet4:EVENt?
```

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	LOPC	AISC	HPRDIPC	HPRDIPS	HPRDIPP	UNEQ

DB0 UNEQP - High Order Path Unequipped.
DB1 HPRDIPP - High Order Enhanced RDI-P
DB2 HPRDIPS - High Order Enhanced RDI-S
DB3 HPRDIPC - High Order Enhanced RDI-C
DB4 AISC - Concatenated AIS
DB5 LOPC - Concatenated LOP
DB6 Reserved
DB7 Reserved
DB8 Reserved
DB9 Reserved
DB10 Not used, always read as 0.
DB11 Not used, always read as 0.
DB12 Not used, always read as 0.
DB13 Not used, always read as 0.
DB14 Not used, always read as 0.
DB15 Not used, always read as 0.

OTNSummary Status Register

Provides summary alarm indications related to the OTN Signal .

For related commands, see "STATus subsystem".

Example: STATus:OTNSummary:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	ODU	OTU	OTN

DB0 OTN Status Register Summary
DB1 OTU Status Register Summary
DB2 ODU Status Register Summary
DB3 Not used, always read as 0.
DB4 Not used, always read as 0.
DB5 Not used, always read as 0.
DB6 Not used, always read as 0.
DB7 Not used, always read as 0.
DB8 Not used, always read as 0.
DB9 Not used, always read as 0.
DB10 Not used, always read as 0.
DB11 Not used, always read as 0.
DB12 Not used, always read as 0.
DB13 Not used, always read as 0.
DB14 Not used, always read as 0.
DB15 Not used, always read as 0.

OTN Status Register

Provides primary alarm indications related to the OTN Signal .

For related commands, see "STATus subsystem".

Example: STATus:OTN:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	FECOFF	LOM	OOM	OOF	LOF	-

DB0 Reserved.
DB1 LOF - Loss Of Frame
DB2 OOF - Out Of Frame
DB3 OOM - Out of Multiframe
DB4 LOM - Loss of Multiframe
DB5 FECOFF – FEC All Zeroes
DB6 Not used, always read as 0.
DB7 Not used, always read as 0.
DB8 Not used, always read as 0.
DB9 Not used, always read as 0.
DB10 Not used, always read as 0.
DB11 Not used, always read as 0.
DB12 Not used, always read as 0.
DB13 Not used, always read as 0.
DB14 Not used, always read as 0.
DB15 Not used, always read as 0.

OTUNit Status Register

Provides primary alarm indications related to the OTN OTU Signal .

For related commands, see "STATus subsystem".

Example: STATus:OTUNit:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	IAE	BDI	AIS

DB0 AIS – Alarm Indication Signal
DB1 BDI – Backwards Defect Indicator
DB2 IAE – Incoming Alignment Error
DB3 Not used, always read as 0.
DB4 Not used, always read as 0.
DB5 Not used, always read as 0.
DB6 Not used, always read as 0.
DB7 Not used, always read as 0.
DB8 Not used, always read as 0.
DB9 Not used, always read as 0.
DB10 Not used, always read as 0.
DB11 Not used, always read as 0.
DB12 Not used, always read as 0.
DB13 Not used, always read as 0.
DB14 Not used, always read as 0.
DB15 Not used, always read as 0.

ODUNit Status Register

Provides primary alarm indications related to the OTN ODU Signal .

For related commands, see "STATus subsystem".

Example: STATus:ODUNit:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	LCK	OCI	BDI	AIS

DB0 AIS – Alarm Indication Signal
DB1 BDI – Backwards Defect Indicator
DB2 OCI – Open Connection Indication
DB3 LCK – Locked Indication
DB4 Not used, always read as 0.
DB5 Not used, always read as 0.
DB6 Not used, always read as 0.
DB7 Not used, always read as 0.
DB8 Not used, always read as 0.
DB9 Not used, always read as 0.
DB10 Not used, always read as 0.
DB11 Not used, always read as 0.
DB12 Not used, always read as 0.
DB13 Not used, always read as 0.
DB14 Not used, always read as 0.
DB15 Not used, always read as 0.

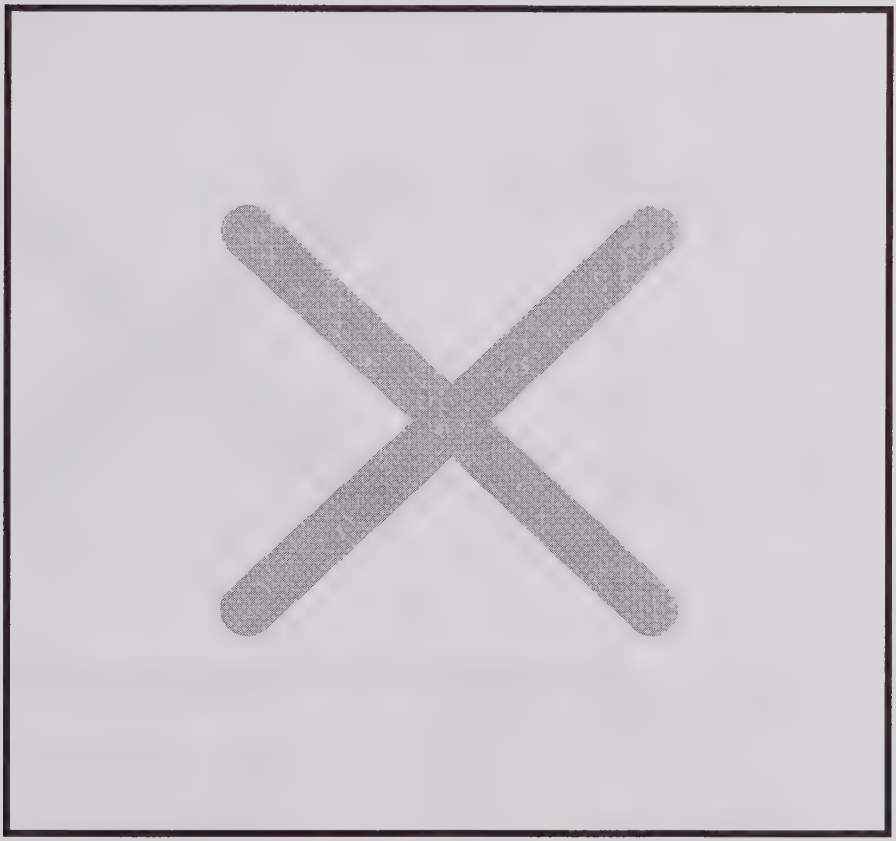

Figure 7-2 Status Registers Relationship 1

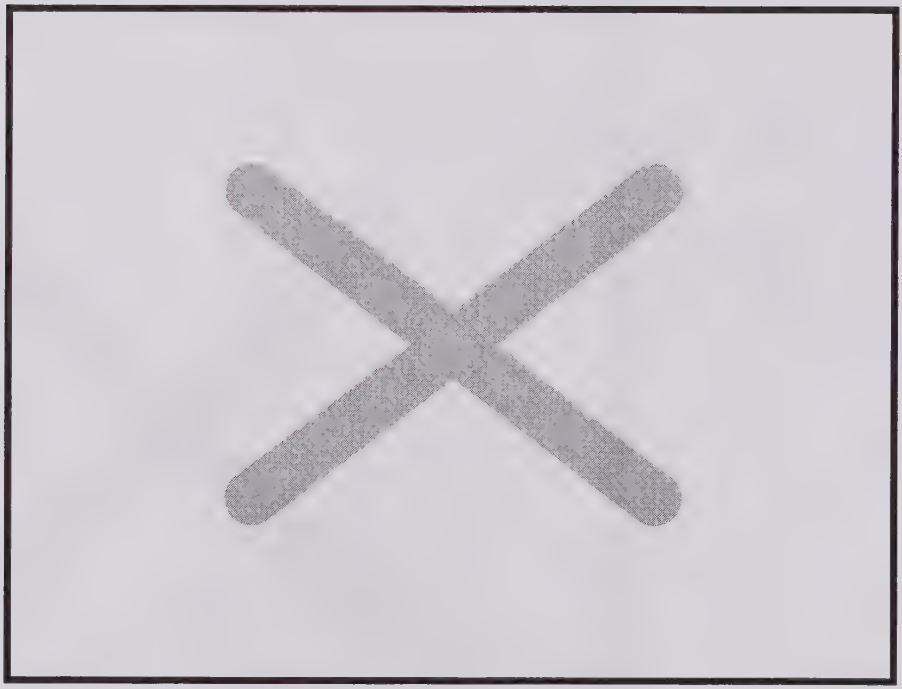

Figure 7-3 Status Registers Relationship 2

Programmed Status Reporting

When a condition is detected, a summary bit is generated by the Status Register which detects the condition. The summary bit in most cases passes through other Status Registers before affecting the Status Byte. These other Status Registers also generate a summary bit. Ttherefore to report a condition requires the setting of the Event Enable Register mask in all registers in the chain.

When implementing Status reporting into your programming, consider the following with reference to the Status Registers Relationship diagrams Figure 7-2 to Figure 7-3.

Programming Interrupts

1) Define which conditions you went reported. To do this, set the Event Enable Register mask of the Status Register that first detects the defined conditions. Set the Event Enable Register mask of err subsequent Status Registers between the reporting Status Register and the Status Byte. Using en example from the SDH Status Register:

LOS + LOF

:STAT:SDH:ENAB 3	Set the SDH event enable register to summarize for LOF(2) + LOS (1)
:STAT:SDH:PTR 3;NTR 0	Transition filter passes positive transitions bits 0 and 1.
:STAT:DATA:ENAB 4	Set the DATA event enable register to summarize for SDH(4)
:STAT:DATA:PTR 4;NTR 0	Transition filter passes positive transitions bit 2.
:STAT:QUES:ENAB 512	Set the QUES event enable register to summarize for DATA(512)
:STAT:QUES:PTR 512;NTR 0	Transition filter passes positive transitions bit 9.

2) If you are implementing a service request/serial port OPERation, set the mask of the Status Byte, for example:

***SRE 40** QUES summary + Standard Event summary

The Status Byte register will initiate a service request (RQS) when either of the masked conditions are detected.

Interpreting Interrupts

1) Check the content of the Status Byte register using the service request/serial port OPERation (SPOLL) or by issuing the *STB? common capabilities command, for example:

***STB?** Returns 8 - QUES summary

2) If a condition has been detected, determine which Status Register is responsible for issuing the summary bit, then use the appropriate STATus commands to interrogate the appropriate registers, for example:

:STAT:QUES:EVEN?	Returns 512 - DATA summary
:STAT:DATA:EVEN?	Returns 4 - SDH summary
:STAT:SDH:EVEN?	Returns 3 - LOF (2) + LOS (1)

The following program example is written in Rocky Mountain Basic and utilizes a combination of SRQ and Status Register filtering.

Status Reporting

8

SCPI Backwards Compatibility Reference

Commands Provided for Backward Compatibility, see page, 8-4
Results Provided for Backward Compatibility , see page, 8-47
OmniBER 718 Features/Commands Not Supported, see page, 8-49
OmniBER 718 SENSe:DATA Results Not Supported, see page, 8-53
OmniBER 718 features with no SCPI support, see page, 8-55
Workarounds for Incompatible OmniBER 718 Commands, see page, 8-56
Backwards Compatibility of STATus commands, see page, 8-59
Backwards Compatibility for Enhanced Testing Upgrade Commands, see page, 8-63
Backwards Compatibility for Enhanced Testing Upgrade Results, see page, 8-67

Backwards Compatibility

Backwards Compatibility

When developing test programs for the OmniBER OTN, it is possible to reduce development time by adapting existing test programs you may have written for the OmniBER 718. This chapter documents the compatibility of the SCPI (Standard Commands for Programmable Instruments) commands between the OmniBER OTN and the OmniBER 718.

Please refer to the preceding chapters for information on SCPI command formats and for a list of commands for the OmniBER OTN.

Please also refer to the OmniBER 718 Remote Control manual for information on the SCPI commands supported by that product.

There is a high degree of functional compatibility between the SCPI commands supported by the OmniBER OTN and OmniBER 718. That is to say, for features supported in both products, e.g. BER testing at 2.5 Gb/s, most commands are identical.

However, due to differences in functionality there are some differences in the operation and the inter-dependencies of commands. When reviewing commands used with OmniBER 718 instrument for reuse with the OmniBER OTN you are encouraged to migrate to the new, 'preferred', commands (This will minimize future compatibility issues with test programs).

Commands listed in this chapter as being provided for backwards compatibility may not be provided in future versions of the OmniBER OTN.

This chapter is structured as follows

1. Commands Provided for Backward Compatibility

These are commands which are identical to the OmniBER 718 command, but have been added to the OmniBER OTN command set to make the OTN compatible.

There will be another, slightly different, 'preferred' command in the OmniBER OTN that will perform the same function.

2. OmniBER 718 Features/Commands Not Supported

This section lists OmniBER 718 commands for features, and therefore SCPI commands, which are NOT supported in the OmniBER OTN e.g. ATM and POS.

3. OmniBER 718 features with no SCPI support

Commands for features supported in both instruments but NO SCPI support in OmniBER OTN.

4. Workarounds for Incompatible Commands

Commands for which there is a workaround in the OmniBER OTN. For example, some commands are common between the two instruments but support different parameters. In these instances there is usually (at least) one parameter which is also common.

5. Backwards Compatibility for Enhanced Testing Upgrade

This section details features and commands that are not available at initial release, but are expected to be provided with Enhanced Testing Upgrade J7265A option 500.

Commands Provided for Backward Compatibility

For parameter details of the backward compatible commands please refer to the SCPI manual for your OmniBER 718 instrument.

For longer-term support it is recommended that the preferred commands belonging to the command set of your OmniBER OTN be used where possible.

As a result of changes to international standards and functional differences between the OmniBER OTN and the OmniBER 718 instruments, some parameter values for older commands may be unavailable in the OmniBER OTN and visa-versa. Please refer to the appropriate instrument manuals to determine the functionality available.

In addition, some SCPI commands provided in the OmniBER OTN reuse a command header from earlier OmniBER 718 but have a limited functional or parameter overlap. Where practical, backwards compatibility has been provided. Again, the preferred commands or parameter values are recommended for future use.

:FETCh

:FETCh:ARRay:DATA:TELecom:SDH:OVERhead? <numeric>,<numeric>,<numeric>

Limitations: Instrument should be in remote control mode

Preferred: :SENSe:DATA:TELecom:SDH:OVERhead:CHANnel

:FETCh:ARRay:DATA:TELECOM:SDH:OVERhead:DATA?

See also:

:FETCh:ARRay:DATA:TELecom:SDH:POVerhead? <numeric>

Limitations:

Preferred: :FETCh:ARRay:DATA:TELECOM:SDH:POVerhead:DATA?

See also:

:FETCh:ARRay:DATA:TELecom:SONet:OVERhead?
<numeric>,<numeric>,<numeric>

Limitations: Instrument should be in remote control mode

Preferred: :SENSe:DATA:TELecom:SONet:OVERhead:CHANnel

:FETCh:ARRay:DATA:TELECOM:SONet:OVERhead:DATA?

See also:

:FETCh:ARRay:DATA:TELecom:SONet:POVerhead? <numeric>

Limitations:

Preferred: :FETCh:ARRay:DATA:TELECOM:SONet:POVerhead:DATA?

See also:

:FETCh:SCALar:DATA:TELecom:SDH:OVERhead?
<numeric>,<numeric>, <discrete>

Limitations: Instrument should be in remote control mode

Preferred: :SENSe:DATA:TELecom:SDH:OVERhead:CHANnel

:FETCh:SCALar:DATA:TELECOM:SDH:OVERhead:DATA?

See also:

:FETCh:SCALar:DATA:TELecom:SDH:POVerhead? <discrete>

Limitations:

Preferred: :FETCh:SCALar:DATA:TELECOM:SDH:POVerhead:DATA?

See also:

:FETCh:SCALar:DATA:TELecom:SONet:OVERhead?
<numeric>,<numeric>, <discrete>

Limitations: Instrument should be in remote control mode

Preferred: :SENSe:DATA:TELecom:SONet:OVERhead:CHANnel

:FETCh:SCALar:DATA:TELECOM:SONet:OVERhead:DATA?

See also:

:FETCh:SCALar:DATA:TELecom:SONet:POVerhead? <discrete>

Limitations:

Preferred: :FETCh:SCALar:DATA:TELECOM:SONet:POVerhead:DATA?

See also:

:FETCh:STRing:DATA:TELecom:SDH:K1?

Limitations:
Preferred: :FETCh:SCALar:DATA:TELecom:SDH:OVERhead:K1?
See also:

:FETCh:STRing:DATA:TELecom:SDH:K2?

Limitations:
Preferred: :FETCh:SCALar:DATA:TELecom:SDH:OVERhead:K2?
See also:

:FETCh:STRing:DATA:TELecom:SDH:S1?

Limitations:
Preferred: :FETCh:SCALar:DATA:TELecom:SDH:OVERhead:S1?
See also:

:FETCh:STRing:DATA:TELecom:SONet:K1?

Limitations:
Preferred: :FETCh:SCALar:DATA:TELecom:SONet:OVERhead:K1?
See also:

:FETCh:STRing:DATA:TELecom:SONet:K2?

Limitations:
Preferred: :FETCh:SCALar:DATA:TELecom:SONet:OVERhead:K2?
See also:

:FETCh:STRing:DATA:TELecom:SONet:S1?

Limitations:
Preferred: :FETCh:SCALar:DATA:TELecom:SONet:OVERhead:S1?
See also:

:INPut:TELecom

:INPut:TELecom:OC3:INTerface <discrete>

Limitations: Also affects interface state of other OC types

Parameter values not supported MONitor
Preferred: :INPut:TELecom:INTerface
See also: :INPut:TELecom:OC12:INTerface
:INPut:TELecom:OC48:INTerface
:INPut:TELecom:OPT1:INTerface
:INPut:TELecom:OPT4:INTerface
:INPut:TELecom:OPT16:INTerface

The corresponding query returns the interface state in discrete form.

:INPut:TELecom:OC3:RATE <discrete>

Limitations: Also affects RATE of other OC types
Preferred: :SENSe:DATA:TELecom:SDH:RATE
See also: :INPut:TELecom:OC12:RATE
:INPut:TELecom:OC48:RATE

The corresponding query returns the rate in discrete form.

:INPut:TELecom:OC12:INTerface <discrete>

Limitations: Also affects interface state of other OC types
Parameter values not supported MONitor
Preferred: :INPut:TELecom:INTerface
See also: :INPut:TELecom:OC3:INTerface
:INPut:TELecom:OC48:INTerface
:INPut:TELecom:OPT1:INTerface
:INPut:TELecom:OPT4:INTerface
:INPut:TELecom:OPT16:INTerface

The corresponding query returns the interface state in discrete form.

:INPut:TELecom:OC12:RATE <discrete>

Limitations: Also affects RATE of other OC types
Preferred: :SENSe:DATA:TELecom:SDH:RATE

See also: :INPut:TELecom:OC3:RATE
:INPut:TELecom:OC48:RATE

The corresponding query returns the rate in discrete form.

:INPut:TELecom:OC48:INTerface <discrete>

Limitations: Also affects interface state of other OC types
Parameter values not supported MONitor
Preferred: :INPut:TELecom:INTerface
See also: :INPut:TELecom:OC3:INTerface
:INPut:TELecom:OC12:INTerface
:INPut:TELecom:OPT1:INTerface
:INPut:TELecom:OPT4:INTerface
:INPut:TELecom:OPT16:INTerface

The corresponding query returns the interface state in discrete form.

:INPut:TELecom:OC48:RATE <discrete>

Limitations: Also affects RATE of other OC types
Preferred: :SENSe:DATA:TELecom:SDH:RATE
See also: :INPut:TELecom:OC3:RATE
:INPut:TELecom:OC12:RATE

The corresponding query returns the rate in discrete form.

:INPut:TELecom:OPT1:INTerface <discrete>

Limitations: Also affects interface state of other OC types
Parameter values not supported MONitor
Preferred: :INPut:TELecom:INTerface
See also: :INPut:TELecom:OC3:INTerface
:INPut:TELecom:OC12:INTerface
:INPut:TELecom:OC48:INTerface
:INPut:TELecom:OPT4:INTerface

:INPut:TELecom:OPT16:INTerface

The corresponding query returns the interface state in discrete form.

:INPut:TELecom:OPT1:RATE <discrete>

Limitations: Also affects rate of other OPT types
Preferred: :SENSe:DATA:TELecom:SONet:RATE
See also: :INPut:TELecom:OPT4:RATE
:INPut:TELecom:OPT16:RATE

The corresponding query returns the rate in discrete form.

:INPut:TELecom:OPT4:INTerface <discrete>

Limitations: Also affects interface state of other OC types
Parameter values not supported MONitor
Preferred: :INPut:TELecom:INTerface
See also: :INPut:TELecom:OC3:INTerface
:INPut:TELecom:OC12:INTerface
:INPut:TELecom:OC48:INTerface
:INPut:TELecom:OPT1:INTerface
:INPut:TELecom:OPT16:INTerface

The corresponding query returns the interface state in discrete form.

:INPut:TELecom:OPT4:RATE <discrete>

Limitations: Also affects rate of other OPT types
Preferred: :SENSe:DATA:TELecom:SONet:RATE
See also: :INPut:TELecom:OPT1:RATE
:INPut:TELecom:OPT16:RATE

The corresponding query returns the rate in discrete form.

:INPut:TELecom:OPT16:INTerface <discrete>

Limitations: Also affects interface state of other OC types
Parameter values not supported MONitor
Preferred: :INPut:TELecom:INTerface
See also: :INPut:TELecom:OC3:INTerface
:INPut:TELecom:OC12:INTerface
:INPut:TELecom:OC48:INTerface
:INPut:TELecom:OPT1:INTerface
:INPut:TELecom:OPT4:INTerface

The corresponding query returns the interface state in discrete form.

:INPut:TELecom:OPT16:RATE <discrete>

Limitations: Also affects rate of other OPT types
Preferred: :SENSe:DATA:TELecom:SONet:RATE
See also: :INPut:TELecom:OPT1:RATE
:INPut:TELecom:OPT4:RATE

The corresponding query returns the rate in discrete form.

:OUTPut:TELecom

:OUTPut:TELecom:OC3:LASer <boolean>

Limitations: Also affects the LASer state of other OC and OPT types
Preferred: :OUTPut:TELecom:LASer
See also: :OUTPut:TELecom:OC12:LASer
:OUTPut:TELecom:OC48:LASer
:OUTPut:TELecom:OPT1:LASer
:OUTPut:TELecom:OPT4:LASer
:OUTPut:TELecom:OPT16:LASer

The corresponding query returns the laser state in boolean form.

:OUTPut:TELecom:OC3:RATE <discrete>

Limitations: Also affects the wavelength of other OC types
Preferred: :SOURce:DATA:TELecom:SDH:RATE
See also: :OUTPut:TELecom:OC12:RATE
:OUTPut:TELecom:OC48:RATE
:OUTPut:TELecom:SDH:RATE

The corresponding query returns the output rate in discrete form.

:OUTPut:TELecom:OC3:WAVelength <discrete>

Limitations: Also affects the wavelength of other OC and OPT types
Preferred: :OUTPut:TELecom:WAVelength
See also: :OUTPut:TELecom:OC12:WAVelength
:OUTPut:TELecom:OC48:WAVelength
:OUTPut:TELecom:OPT1:WAVelength
:OUTPut:TELecom:OPT4:WAVelength
:OUTPut:TELecom:OPT16:WAVelength

The corresponding query returns the wavelength in discrete form.

:OUTPut:TELecom:OC12:LASer <boolean>

Limitations: Also affects the LASer state of other OC and OPT types
Preferred: :OUTPut:TELecom:LASer
See also: :OUTPut:TELecom:OC3:LASer
:OUTPut:TELecom:OC48:LASer
:OUTPut:TELecom:OPT1:LASer
:OUTPut:TELecom:OPT4:LASer
:OUTPut:TELecom:OPT16:LASer

The corresponding query returns the laser state in boolean form.

:OUTPut:TELecom:OC12:RATE <discrete>

Limitations: Also affects the wavelength of other OC types

Preferred: :SOURce:DATA:TELecom:SDH:RATE
See also: :OUTPut:TELecom:OC3:RATE
:OUTPut:TELecom:OC48:RATE
:OUTPut:TELecom:SDH:RATE

The corresponding query returns the output rate in discrete form.

:OUTPut:TELecom:OC12:WAVelength <discrete>

Limitations: Also affects the wavelength of other OC and OPT types
Preferred: :OUTPut:TELecom:WAVelength
See also: :OUTPut:TELecom:OC3:WAVelength
:OUTPut:TELecom:OC48:WAVelength
:OUTPut:TELecom:OPT1:WAVelength
:OUTPut:TELecom:OPT4:WAVelength
:OUTPut:TELecom:OPT16:WAVelength

The corresponding query returns the wavelength in discrete form.

:OUTPut:TELecom:OC48:LASer <boolean>

Limitations: Also affects the LASer state of other OC and OPT types
Preferred: :OUTPut:TELecom:LASer
See also: :OUTPut:TELecom:OC3:LASer
:OUTPut:TELecom:OC12:LASer
:OUTPut:TELecom:OPT1:LASer
:OUTPut:TELecom:OPT4:LASer
:OUTPut:TELecom:OPT16:LASer

The corresponding query returns the laser state in boolean form.

:OUTPut:TELecom:OC48:RATE <discrete>

Limitations: Also affects the wavelength of other OC types
Preferred: :SOURce:DATA:TELecom:SDH:RATE
See also: :OUTPut:TELecom:OC3:RATE

:OUTPut:TELecom:OC12:RATE
:OUTPut:TELecom:SDH:RATE

The corresponding query returns the output rate in discrete form.

:OUTPut:TELecom:OC48:WAVelength <discrete>

Limitations: Also affects the wavelength of other OC and OPT types
Preferred: :OUTPut:TELecom:WAVelength
See also: :OUTPut:TELecom:OC3:WAVelength
:OUTPut:TELecom:OC12:WAVelength
:OUTPut:TELecom:OPT1:WAVelength
:OUTPut:TELecom:OPT4:WAVelength
:OUTPut:TELecom:OPT16:WAVelength

The corresponding query returns the wavelength in discrete form.

:OUTPut:TELecom:OPT1:LASer <boolean>

Limitations: Also affects the LASer state of other OC and OPT types
Preferred: :OUTPut:TELecom:LASer
See also: :OUTPut:TELecom:OC3:LASer
:OUTPut:TELecom:OC12:LASer
:OUTPut:TELecom:OC48:LASer
:OUTPut:TELecom:OPT4:LASer
:OUTPut:TELecom:OPT16:LASer

The corresponding query returns the laser state in boolean form.

:OUTPut:TELecom:OPT1:RATE <discrete>

Limitations: Also affects the wavelength of other OPT types
Preferred: :SOURce:DATA:TELecom:SONet:RATE
See also: :OUTPut:TELecom:OPT4:RATE
:OUTPut:TELecom:OPT4:RATE
:OUTPut:TELecom:SONet:RATE

The corresponding query returns the output rate in discrete form.

:OUTPut:TELecom:OPT1:WAVelength <discrete>

Limitations: Also affects the wavelength of other OC and OPT types
Preferred: :OUTPut:TELecom:WAVelength
See also: :OUTPut:TELecom:OC3:WAVelength
:OUTPut:TELecom:OC12:WAVelength
:OUTPut:TELecom:OC48:WAVelength
:OUTPut:TELecom:OPT4:WAVelength
:OUTPut:TELecom:OPT16:WAVelength

The corresponding query returns the wavelength in discrete form.

:OUTPut:TELecom:OPT4:LASer <boolean>

Limitations: Also affects the LASer state of other OC and OPT types
Preferred: :OUTPut:TELecom:LASer
See also: :OUTPut:TELecom:OC3:LASer
:OUTPut:TELecom:OC12:LASer
:OUTPut:TELecom:OC48:LASer
:OUTPut:TELecom:OPT1:LASer
:OUTPut:TELecom:OPT16:LASer

The corresponding query returns the laser state in boolean form.

:OUTPut:TELecom:OPT4:RATE <discrete>

Limitations: Also affects the wavelength of other OPT types
Preferred: :SOURce:DATA:TELecom:SONet:RATE
See also: :OUTPut:TELecom:OPT1:RATE
:OUTPut:TELecom:OPT16:RATE
:OUTPut:TELecom:SONet:RATE

The corresponding query returns the output rate in discrete form.

:OUTPut:TELecom:OPT4:WAVelength <discrete>

Limitations: Also affects the wavelength of other OC and OPT types
Preferred: :OUTPut:TELecom:WAVelength
See also: :OUTPut:TELecom:OC3:WAVelength
:OUTPut:TELecom:OC12:WAVelength
:OUTPut:TELecom:OC48:WAVelength
:OUTPut:TELecom:OPT1:WAVelength
:OUTPut:TELecom:OPT16:WAVelength

The corresponding query returns the wavelength in discrete form.

:OUTPut:TELecom:OPT16:LASer <boolean>

Limitations: Also affects the LASer state of other OC and OPT types
Preferred: :OUTPut:TELecom:LASer
See also: :OUTPut:TELecom:OC3:LASer
:OUTPut:TELecom:OC12:LASer
:OUTPut:TELecom:OC48:LASer
:OUTPut:TELecom:OPT1:LASer
:OUTPut:TELecom:OPT4:LASer

The corresponding query returns the laser state in boolean form.

:OUTPut:TELecom:OPT16:RATE <discrete>

Limitations: Also affects the wavelength of other OPT types
Preferred: :SOURce:DATA:TELecom:SONet:RATE
See also: :OUTPut:TELecom:OPT1:RATE
:OUTPut:TELecom:OPT4:RATE
:OUTPut:TELecom:SONet:RATE

The corresponding query returns the output rate in discrete form.

:OUTPut:TELecom:OPT16:WAVelength <discrete>

Limitations: Also affects the wavelength of other OC and OPT types

Preferred: :OUTPut:TELecom:WAVelength
See also: :OUTPut:TELecom:OC3:WAVelength
:OUTPut:TELecom:OC12:WAVelength
:OUTPut:TELecom:OC48:WAVelength
:OUTPut:TELecom:OPT1:WAVelength
:OUTPut:TELecom:OPT4:WAVelength

The corresponding query returns the wavelength in discrete form.

:OUTPut:TELecom:SDH:RATE <discrete>

Limitations: Also affects the wavelength of OC types
Preferred: :SOURce:DATA:TELecom:SDH:RATE
See also: :OUTPut:TELecom:OC3:RATE
:OUTPut:TELecom:OC12:RATE
:OUTPut:TELecom:OC48:RATE

The corresponding query returns the output rate in discrete form.

:OUTPut:TELecom:SONet:RATE <discrete>

Limitations: Also affects the wavelength of OPT types
Preferred: :SOURce:DATA:TELecom:SONet:RATE
See also: :OUTPut:TELecom:OPT1:RATE
:OUTPut:TELecom:OPT4:RATE
:OUTPut:TELecom:OPT16:RATE

The corresponding query returns the output rate in discrete form.

:SOURce:CLOCk

:SOURce:CLOCk:SDH:FOFFset:OFFSet <numeric><suffix>

Limitations: Default suffix now PPM, ratio no longer supported
Preferred: :SOURce:CLOCk:SDH:FOFFset:OFFSet <numeric>

See also:

The corresponding query returns the clock offset in PPM.

:SOURce:CLOCk:SDH:FORMat <discrete>

Limitations: Also affects the setting of SONET clock format
Parameter values not supported: K64

Preferred: :SOURce:CLOCk:FORMat <discrete>

See also: :SOURce:CLOCk:SONet:FORMat

The corresponding query returns the clock format in discrete from.

:SOURce:CLOCk:SDH:SOURce <discrete>

Limitations: Also affects the settings for SONet clock source
Parameter values not supported: RMON0
RMON1
RMON4

Preferred: :SOURce:CLOCk:SOURce
:SOURce:CLOCk:RECovered

See also: :SOURce:CLOCk:SONet:SOURce

The corresponding query returns the clock source in discrete form.

:SOURce:CLOCk:SONet:FOFFset:OFFSet <numeric> <suffix>

Limitations: Default suffix now PPM, ratio no longer supported

Preferred: :SOURce:CLOCk:SONet:FOFFset:OFFSet <numeric>

See also:

The corresponding query returns the clock offset in PPM.

:SOURce:CLOCk:SONet:FORMat <discrete>

Limitations: Also affects the setting of SDH clock format
Parameter values not supported: K64

Preferred: :SOURce:CLOCk:FORMat <discrete>

See also: :SOURce:CLOCk:SDH:FORMat

The corresponding query returns the clock format in discrete from.

:SOURce:CLOCk:SONet:SOURce <discrete>

Limitations: Also affects the settings for SDH clock source
Parameter values not supported: RMN1
RMN3
RMN12

Preferred: :SOURce:CLOCk:SOURce
:SOURce:CLOCk:RECovered

See also: :SOURce:CLOCk:SDH:SOURce

The corresponding query returns the clock source in discrete form.

:SOURce:DATA:TELecom:

:SOURce:DATA:TELecom:TFUNction<discrete>

Limitations: Parameter values not supported: PDHPayload
PDH
SDISruption
ATM
POS
Values accepted but perform no function: SDH
SONet

Preferred: :SOURce:DATA:TELecom:TFUNction:DISable
Test Function selection commands

See also: :SOURce:DATA:TELecom:SONet:ALARm
:SOURce:DATA:TELecom:SONet:ERRor:TYPE
:SOURce:DATA:TELecom:SONet:MSPMessages:...
:SOURce:DATA:TELecom:SONet:POINter:...

:SOURce:DATA:TELecom:SOURce <discrete>

Limitations: This command performs no function.
It is provided solely for backward compatibility.
Parameter values not supported: PDH
SDH
SONet

Preferred:

See also:

The corresponding query always returns the discrete value OPTical.

:SOURce:DATA:TELecom:SDH:

:SOURce:DATA:TELecom:SDH:ALARm <discrete>

Limitations: Parameter values not supported: TULop
TUPais
LPRDi
LOMultiframe
TUUNequiped

Preferred: :SOURce:DATA:TELecom:ALARm
:SOURce:DATA:TELecom:SDH:ALARm:GROup
:SOURce:DATA:TELecom:SDH:ALARm:PHYSical
:SOURce:DATA:TELecom:SDH:ALARm:SECTion
:SOURce:DATA:TELecom:SDH:ALARm:PATH
:SOURce:DATA:TELecom:SDH:ALARm:TCM
:SOURce:DATA:TELecom:SDH:ALARm:HERDi

See also:

The corresponding query returns the SDH Alarm in discrete form.

Commands Provided for Backward Compatibility

:SOURce:DATA:TELecom:SDH:ALARm:SOOFrame

Limitations: Affects :SOURce:DATA:TELecom:SDH:ALARm settings
Preferred: :SOURce:DATA:TELecom:SDH:ALARm:OOF
See also: :SOURce:DATA:TELecom:SDH:ALARm

:SOURce:DATA:TELecom:SDH:AU3:BACKground <discrete>

Limitations: Affects the background for all AU types,
Preferred: :SOURce:DATA:TELecom:SDH:AU:BACKground
See also: :SOURce:DATA:TELecom:SDH:AU4:BACKground
:SOURce:DATA:TELecom:SDH:AU4C:BACKground

The corresponding query returns the Background in discrete form.

:SOURce:DATA:TELecom:SDH:AU4 <numeric>

Limitations:
Preferred: :SOURce:DATA:TELecom:SDH:AUG1
:SOURce:DATA:TELecom:SDH:AUG4
See also:

The corresponding query returns the AU4 in numeric form.

:SOURce:DATA:TELecom:SDH:AU4:BACKground <discrete>

Limitations: Affects the background for all AU types,
Preferred: :SOURce:DATA:TELecom:SDH:AU:BACKground
See also: :SOURce:DATA:TELecom:SDH:AU3:BACKground
:SOURce:DATA:TELecom:SDH:AU4C:BACKground

The corresponding query returns the Background in discrete form.

:SOURce:DATA:TELecom:SDH:AU4C <numeric>

Limitations:
Preferred: :SOURce:DATA:TELecom:SDH:AUG4
See also:

The corresponding query returns the AU4C in numeric form.

:SOURce:DATA:TELecom:SDH:AU4C:BACKground <discrete>

Limitations: Affects the background for all AU types,
Preferred: :SOURce:DATA:TELecom:SDH:AU:BACKground
See also: :SOURce:DATA:TELecom:SDH:AU3:BACKground
:SOURce:DATA:TELecom:SDH:AU4:BACKground

The corresponding query returns the Background in discrete form.

:SOURce:DATA:TELecom:SDH:ERRor:MSPThreshold:EINTerval <discrete>

Limitations:
Preferred: :SOURce:DATA:TELecom:SDH:ERRor:ASPThreshold:EINTerval
See also:

The corresponding query returns the MSP Threshold:Error Interval in discrete form.

:SOURce:DATA:TELecom:SDH:ERRor:MSPThreshold:NERRors <numeric>

Limitations:
Preferred: :SOURce:DATA:TELecom:SDH:ERRor:ASPThreshold:NERRors
See also:

The corresponding query returns the MSP Threshold Number of Errors in numeric form.

:SOURce:DATA:TELecom:SDH:ERRor:TYPE <discrete>

Limitations: Parameter values not supported: TCBip
TUBip
Preferred: :SOURce:DATA:TELecom:SDH:ERRor:GROup
:SOURce:DATA:TELecom:SDH:ERRor:SECTion
:SOURce:DATA:TELecom:SDH:ERRor:PATH

:SOURce:DATA:TELecom:SDH:ERRor:TCM
:SOURce:DATA:TELecom:SDH:ERRor:PATTern
:SOURce:DATA:TELecom:SDH:ERRor:PDH
:SOURce:DATA:TELecom:SDH:ERRor:DSN

See also:

The corresponding query returns the Error Type in discrete form.

:SOURce:DATA:TELecom:SDH:MAPPing <discrete>

Limitations: Also affects SONet mapping
Parameter values not supported: M140
M34
DS3
ATM
IPOS

Preferred: :SOURce:DATA:TELecom:SDH:PATTern

See also: :SOURce:DATA:TELecom:SONet:MAPPing

The corresponding query returns the SDH Mapping in discrete form.

:SOURce:DATA:TELecom:SDH:MSPMessages:ARCHitecture <discrete>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages: ARCHitecture

See also:

The corresponding query returns the MSP Messages Architecture in discrete form.

:SOURce:DATA:TELecom:SDH:MSPMessages:BRIDge <string>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:BRIDge

See also:

The corresponding query returns the MSP Messages Bridged channel in string form.

:SOURce:DATA:TELecom:SDH:MSPMessages:CHANnel <numeric>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:CHANnel

See also:

The corresponding query returns the MSP Messages Channel in numeric form.

:SOURce:DATA:TELecom:SDH:MSPMessages:DNODe <string>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:DNODe

See also:

The corresponding query returns the MSP Messages Destination Node in string form.

:SOURce:DATA:TELecom:SDH:MSPMessages:PCODe <discrete>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:PCODe

See also:

The corresponding query returns the MSP Messages Path Type in discrete form.

:SOURce:DATA:TELecom:SDH:MSPMessages:RCODe <discrete>

Limitations: Also affects the Linear topology setting of :SOURce:DATA:TELecom:SDH:MSPMessages:REQuest

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:RCODe

See also: :SOURce:DATA:TELecom:SDH:MSPMessages:REQuest

The corresponding query returns the MSP Messages Type (K1 Byte, bits 1 to 4) in discrete form.

:SOURce:DATA:TELecom:SDH:MSPMessages:REQuest <discrete>

Limitations: Also ffects the Ring topology setting of :SOURce:DATA:TELecom:SDH:MSPMessages:RCODe

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:REQuest

See also: :SOURce:DATA:TELecom:SDH:MSPMessages:RCODe

The corresponding query returns the MSP Messages Type (K1 Byte, bits 1 to 4) in discrete form.

:SOURce:DATA:TELecom:SDH:MSPMessages:REServed <numeric>

Limitations: Also affects the Ring topology setting of :SOURce:DATA:TELecom:SDH:MSPMessages:SCODe

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:REServed

See also: :SOURce:DATA:TELecom:SDH:MSPMessages:SCODe

The corresponding query returns the MSP Messages Type (K2 Byte, bits 6 to 8) in numeric form.

:SOURce:DATA:TELecom:SDH:MSPMessages:SCODe <discrete>

Limitations: Also affects the Linear topoogy setting of :SOURce:DATA:TELecom:SDH:MSPMessages:REServed

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:SCODe

See also: :SOURce:DATA:TELecom:SDH:MSPMessages:REServed

The corresponding query returns the MSP Messages Type (K2 Byte, bits 6 to 8) in discrete form.

:SOURce:DATA:TELecom:SDH:MSPMessages:SNODe <string>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:SNODe

See also:

The corresponding query returns the MSP Messages Source Node in string form.

:SOURce:DATA:TELecom:SDH:MSPMessages:TOPology <discrete>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:TOPology

See also:

The corresponding query returns the MSP Messages Topology Protection Mode in discrete form.

:SOURce:DATA:TELecom:SDH:OVERhead:DATA <numeric>,<numeric>,<discrete>,<string>

Limitations: New query return type is <numeric>

Preferred: :SOURce:DATA:TELecom:SDH:OVERhead:DATA <numeric>, <numeric>, <discrete>, <numeric>

See also:

The corresponding query :SOURce:DATA:TELecom:SDH:OVERhead:DATA? <numeric>, <numeric>, <discrete> returns the requested overhead data byte in numeric form.

:SOURce:DATA:TELecom:SDH:OVERhead:DATA:HEXadecimal <numeric>,<numeric>,<discrete>,<string>

Limitations: Affects the overhead data for SONET also

Preferred: :SOURce:DATA:TELecom:SDH:OVERhead:DATA

See also: :SOURce:DATA:TELecom:SONet:OVERhead:DATA:HEXadecimal

The corresponding query returns the requested overhead byte in Hexadecimal string format.

:SOURce:DATA:TELecom:SDH:OVERhead:J0 <string>

Limitations: Affects the J0 string for SONET also

Preferred: :SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:B16Crc

See also: :SOURce:DATA:TELecom:SONet:OVERhead:J0

The corresponding query returns the User defined J0 Pattern in string form.

:SOURce:DATA:TELecom:SDH:OVERhead:J0:HEXadecimal?

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:Array?

See also:

Returns <block>

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern <discrete>

Limitations: Older parameter value not supported — TEST
Older parameter value supported — USER
New parameter value preferred — B16Crc

The corresponding query returns the J0 pattern type in discrete form.

:SOURce:DATA:TELecom:SDH:PAYLoad <discrete>

Limitations: Parameter values not supported: M140, TU3 *or* M34, TU12 *or* M2, TU2, TU11 *or* DS1

Preferred: :SOURce:DATA:TELecom:SDH:PAYLoad
:SOURce:DATA:TELecom:SDH:TU

See also: :SOURce:DATA:TELecom:SDH:PAYLoad

Note: This command has been reused in newer OmniBER instruments and has a slightly different functionality. Backward compatibility has been retained by processing the older <discrete> values. However, the corresponding query returns the Payload type valid with the OmniBER OTN instrument.

:SOURce:DATA:TELecom:SDH:PAYLoad:PATTern <discrete>

Limitations: Affects all Payload Patterns not just SDH

Preferred: :SOURce:DATA:TELecom:PATTern:TYPe
:SOURce:DATA:TELecom:PATTern:TYPe:PRBS
:SOURce:DATA:TELecom:PATTern:TYPe:WORD
:SOURce:DATA:TELecom:PATTern:TYPe:WORD:PRESet

See also: :SOURce:DATA:TELecom:SONet:PAYLoad:PATTern

The corresponding query returns the Payload Pattern in discrete form.

:SOURce:DATA:TELecom:SDH:PAYLoad:UWORd <string>

Limitations: Affects User Word for SONET also
Preferred: :SOURce:DATA:TELecom:PATTern:TYPE:WORD:USER
See also: :SOURce:DATA:TELecom:SONet:PAYLoad:PATTern:UWORd

The corresponding query returns the User defined Word in string form.

:SOURce:DATA:TELecom:SDH:POINter:ACTion

Limitations:
Preferred: :SOURce:DATA:TELecom:SDH:POINter:NEW:ACTion
See also:

:SOURce:DATA:TELecom:SDH:POINter:ADJust

Limitations:
Preferred: :SOURce:DATA:TELecom:SDH:POINter:BURst:ACTion
See also:

:SOURce:DATA:TELecom:SDH:POINter:DIRection <discrete>

Limitations: Also affects SONET pointer
Preferred: :SOURce:DATA:TELecom:SDH:POINter:BURSt:DIRection
See also:

The corresponding query returns the Pointer Burst Direction in discrete form.

:SOURce:DATA:TELecom:SDH:POINter:IDECrement <numeric>

Limitations: Also affects SONET pointer
Preferred: :SOURce:DATA:TELecom:SDH:POINter:BURSt:SIZE
See also:

The corresponding query returns the Pointer Burst Increment or Decrement Size in numeric form.

:SOURce:DATA:TELecom:SDH:POINter:NPOinter <discrete>

Limitations: Also affects SONET pointer

Preferred: :SOURce:DATA:TELecom:SDH:POINter:NEW:FLAG

See also:

The corresponding query returns the Pointer New Data Flag in discrete form.

:SOURce:DATA:TELecom:SDH:POINter:OFFSet <discrete>

Limitations: Affects SONet setting also

Older parameter values not supported TU

Older parameter values supported SIGNal VC4

New parameter values preferred SIGNal PAYLoad

The corresponding query returns the Pointer Offset type in discrete form.

:SOURce:DATA:TELecom:SDH:POINter:OFFset:RATE <numeric><suffix>

Limitations: Default suffix now PPM, ratio no longer supported

Preferred: :SOURce:DATA:TELecom:SDH:POINter:OFFset:RATE <numeric>

See also:

The corresponding query returns the pointer offset rate in PPM.

:SOURce:DATA:TELecom:SDH:POINter:VALue <numeric>

Limitations: Also affects SONET pointer

Preferred: :SOURce:DATA:TELecom:SDH:POINter:NEW:VALue

See also:

The corresponding query returns the New Pointer Value in numeric form.

:SOURce:DATA:TELecom:SDH:POVerhead:DATA <discrete>,<string>

Limitations: New query return type is <numeric>

Preferred: :SOURce:DATA:TELecom:SDH:POVerhead:DATA <discrete>, <numeric>

See also:

The corresponding query returns the requested Path Overhead data in numeric form.

:SOURce:DATA:TELecom:SDH:POVerhead:J1 <string>

Limitations: Also affects SONET J1 string

Preferred: :SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern: B64

See also: :SOURce:DATA:TELecom:SONet:POVerhead:J1

The corresponding query returns the user defined 64 byte Path Overhead J1 data in string form.

:SOURce:DATA:TELecom:SDH:POVerhead:J1:CRC7 <string>

Limitations: Also affects SONET J1 CRC7 string

Preferred: :SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern: B16Crc

See also: :SOURce:DATA:TELecom:SONet:POVerhead:J1:CRC7

The corresponding query returns the user defined 15 Byte Path Overhead J1 CRC 7 data in string form.

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern <discrete>

Limitations: Affects SONet setting also

Older parameter values not supported	TEST	CRC7Test
Older parameter values supported	USER	CRC7User
New parameter values preferred	B64	B16Crc

The corresponding query returns the J1 pattern type in discrete form.

:SOURce:DATA:TELecom:SDH:PRBS:POLarity <discrete>

Limitations: Affects polarity of all PRBS patterns not just SDH

Preferred: :SOURce:DATA:TELecom:PATTern:POLarity

See also: :SOURce:DATA:TELecom:SONet:PRBS:POLarity

The corresponding query returns the PRBS Polarity in discrete form.

:SOURce:DATA:TELecom:SDH:TCM:APID:DATA <string>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:TCM:APID:PATTERN:B16Crc

See also:

The corresponding query returns the 15 byte User defined Tandem Connection APId message in string form.

:SOURce:DATA:TELecom:SDH:TCM:APID:PATTern <discrete>

Limitations:	Older parameter values not supported	DEFault
		TEST
	Older parameter value supported	USER
	New parameter value preferred	B16Crc

The corresponding query returns the TCM Access Point Identifier pattern type in discrete form.

:SOURce:DATA:TELecom:SDH:TCM:PATH <discrete>

Limitations:	Parameter value not supported:	LOW
Preferred:	:SOURce:DATA:TELecom:SDH:TCM:HPATh	
	:SOURce:DATA:TELecom:SDH:TCM:LPATh	

See also:

The corresponding query returns the Tandem Connection Path in discrete form.

:SOURce:DATA:TELecom:SDH:TFUNction:TYPE <discrete>

Limitations:	Accepted but performs no function. Newer OmniBER instruments do not require Test Function Selection
Preferred:	See earlier OmniBER commands listed in 'See also' below.
	:SOURce:DATA:TELecom:TFUNction:DISable
See also:	:SOURce:DATA:TELecom:TFUNction
	:SOURce:DATA:TELecom:SDH:ALARm

:SOURce:DATA:TELecom:SDH:ERRor:TYPE
:SOURce:DATA:TELecom:SDH:MSPMessages:...
:SOURce:DATA:TELecom:SDH:POINter:...

:SOURce:DATA:TELecom:SDH:THRumode <discrete>

Limitations: Affects through mode for all telecom types not just SDH
Preferred: :SOURce:DATA:TELecom:THRu
See also: :SOURce:DATA:TELecom:SONet:THRumode

The corresponding query returns the Through Mode state in discrete form.

:SOURce:DATA:TELecom:SDH:SEQuence:DATA <discrete>,<string>

Limitations: Sequence element now specified by <numeric>. A discrete parameter of A-E will be mapped to 1-5.
Preferred: :SOURce:DATA:TELecom:SDH:SEQuence:DATA <numeric>,<string>
See also:

The corresponding query returns the data value of the specified element.

:SOURce:DATA:TELecom:SONet:

:SOURce:DATA:TELecom:SONet:ALARm <discrete>

Limitations: Parameter values not supported: LOPV
AISV
RDIV
LOMultiframe
VTUNequiped
Preferred: :SOURce:DATA:TELecom:ALARm
:SOURce:DATA:TELecom:SONet:ALARm:GROup
:SOURce:DATA:TELecom:SONet:ALARm:PHYSical
:SOURce:DATA:TELecom:SONet:ALARm:TRANsport
:SOURce:DATA:TELecom:SONet:ALARm:PATH

See also: :SOURce:DATA:TELecom:SDH:ALARm

The corresponding query returns the SDH Alarm in discrete form.

:SOURce:DATA:TELecom:SONet:ALARm:SSEFrame

Limitations: Affects :SOURce:DATA:TELecom:SONet:ALARm settings
Preferred: :SOURce:DATA:TELecom:SONet:ALARm:SEF
See also: :SOURce:DATA:TELecom:SONet:ALARm

:SOURce:DATA:TELecom:SONet:ERRor:TYPE <discrete>

Limitations: Parameter values not supported: REIV
CVV
Preferred: :SOURce:DATA:TELecom:SONet:ERRor:GROup
:SOURce:DATA:TELecom:SONet:ERRor:TRANsport
:SOURce:DATA:TELecom:SONet:ERRor:PATH
:SOURce:DATA:TELecom:SONet:ERRor:PATTern
:SOURce:DATA:TELecom:SONet:ERRor:PDH
:SOURce:DATA:TELecom:SONet:ERRor:DSN
See also:

The corresponding query returns the Error Type in discrete form.

:SOURce:DATA:TELecom:SONet:MAPPing <discrete>

Limitations: Also affects SDH mapping
Parameter values not supported: M140
M34
DS3
ATM
IPOS
Preferred: :SOURce:DATA:TELecom:SONet:PAYLoad
See also: :SOURce:DATA:TELecom:SDH:MAPPing

The corresponding query returns the SDH Mapping in discrete form.

:SOURce:DATA:TELecom:SONet:APSMessages:BRIDge <string>

Limitations: New return type <numeric>

Preferred: :SOURce:DATA:TELecom:SONet:APSMessages:BRIDge <numeric>

See also:

The corresponding query returns the linear APS Message bridged channel in numeric format.

:SOURce:DATA:TELecom:SONet:APSMessages:DNODe <string>

Limitations: New return type <numeric>

Preferred: :SOURce:DATA:TELecom:SONet:APSMessages:DNODe <numeric>

See also:

The corresponding query returns the ring APS Message destination node in numeric format.

:SOURce:DATA:TELecom:SONet:APSMessages:SCODe <discrete>

Limitations: New return type <numeric>

Preferred: :SOURce:DATA:TELecom:SONet:APSMessages:SCODe <numeric>

See also:

The corresponding query returns the ring APS Message status code in numeric format.

:SOURce:DATA:TELecom:SONet:APSMessages:SNODe <string>

Limitations: New return type <numeric>

Preferred: :SOURce:DATA:TELecom:SONet:APSMessages:SNODe <numeric>

See also:

The corresponding query returns the ring APS Message source node in numeric format.

:SOURce:DATA:TELecom:SONet:OVERhead:DATA <numeric>,<numeric>,<discrete>,<string>

Limitations: New return type is <numeric>

Preferred: :SOURce:DATA:TELecom:SONet:OVERhead:DATA <numeric>, <numeric>, <discrete>, <numeric>

See also:

The corresponding query :SOURce:DATA:TELecom:SONet:OVERhead:DATA? <numeric>, <numeric>, <discrete> returns the requested overhead data byte in numeric form.

:SOURce:DATA:TELecom:SONet:OVERhead:DATA:HEXadecimal <numeric>, <numeric>, <discrete>, <string>

Limitations: Affects the overhead data for SDH also

Preferred: :SOURce:DATA:TELecom:SONet:OVERhead:DATA

See also: :SOURce:DATA:TELecom:SDH:OVERhead:DATA: HEXadecimal

The corresponding query :SOURce:DATA:TELecom:SONet:OVERhead:DATA:HEXadecimal? <numeric>,<numeric>,<discrete> returns the requested overhead byte in Hexadecimal string format.

:SOURce:DATA:TELecom:SONet:OVERhead:J0 <string>

Limitations: Affects the J0 string for SONET also

Preferred: :SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern :B16Crc

See also: :SOURce:DATA:TELecom:SDH:OVERhead:J0

The corresponding query returns the User defined J0 Pattern in string form.

:SOURce:DATA:TELecom:SONet:OVERhead:J0:HEXadecimal?

Limitations:

Preferred: :SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern :Array?

See also:

Backwards Compatibility

Commands Provided for Backward Compatibility

Returns <block>

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern <discrete>

Limitations:	Older parameter value not supported	TEST
	Older parameter value supported	USER
	New parameter value preferred	B16Crc

The corresponding query returns the J0 pattern type in discrete form.

:SOURce:DATA:TELecom:SONet:PAYLoad <discrete>

Limitations:	Parameter values not supported:	M140
		TU3 *or* M34
		TU12 *or* M2
		TU2
		TU11 *or* DS1
Preferred:	:SOURce:DATA:TELecom:SONet:PAYLoad	
	:SOURce:DATA:TELecom:SONet:TU	
See also:	:SOURce:DATA:TELecom:SONet:PAYLoad	

Note: This command has been reused in newer OmniBER instruments and has a slightly different functionality. Backward compatibility has been retained by processing the older <discrete> values. However, the corresponding query returns the Payload type valid with the OmniBER OTN instrument.

:SOURce:DATA:TELecom:SONet:PAYLoad:UWORd <string>

Limitations:	Affects User Word for SDH also
Preferred:	:SOURce:DATA:TELecom:PATTern:TYPE:WORD:USER
See also:	:SOURce:DATA:TELecom:SDH:PAYLoad:PATTern:UWORd

The corresponding query returns the User defined Word in string form.

:SOURce:DATA:TELecom:SONet:PDHPayload:ERRor:RATE <discrete>

Limitations: Affects error rate for all payloads

Preferred: :SOURce:DATA:TELecom:SONet:ERRor:RATE

:SOURce:DATA:TELecom:SONet:ERRor:RATE:USER:ACTion

See also:

The corresponding query returns the User defined Word in numeric form.

:SOURce:DATA:TELecom:SONet:PDHPayload:ERRor:RATE:USER <numeric>

Limitations: Affects user error rate for all payloads

Preferred: :SOURce:DATA:TELecom:SONet:ERRor:RATE:USER

:SOURce:DATA:TELecom:SONet:ERRor:RATE:USER:ACTion

See also:

The corresponding query returns the User defined Word in numeric form.

:SOURce:DATA:TELecom:SONet:POINter ACTion

Limitations:

Preferred: :SOURce:DATA:TELecom:SONet:POINter:NEW:ACTion

See also:

:SOURce:DATA:TELecom:SONet:POINter:ADJust

Limitations:

Preferred: :SOURce:DATA:TELecom:SONet:POINter:BURst:ACTion

See also:

:SOURce:DATA:TELecom:SONet:POINter:DIRection <discrete>

Limitations: Also affects SDH pointer

Preferred: :SOURce:DATA:TELecom:SONet:POINter:BURSt:DIRection

See also:

The corresponding query returns the Pointer Burst Direction in discrete form.

Backwards Compatibility

Commands Provided for Backward Compatibility

:SOURce:DATA:TELecom:SONet:POINter:IDECrement <numeric>

Limitations: Also affects SDH pointer

Preferred: :SOURce:DATA:TELecom:SONet:POINter:BURSt:SIZE

See also:

The corresponding query returns the Pointer Burst Increment or Decrement Size in numeric form.

:SOURce:DATA:TELecom:SONet:POINter:NPOinter <discrete>

Limitations: Also affects SDH pointer

Preferred: :SOURce:DATA:TELecom:SONet:POINter:NEW:FLAG

See also:

The corresponding query returns the Pointer New Data Flag in discrete form.

:SOURce:DATA:TELecom:SONet:POINter:OFFSet <discrete>

Limitations: Affects SDH setting also

Older parameter values not supported	VT	
Older parameter values supported	SIGNal	SPE
New parameter values preferred	SIGNal	PAYLoad

:SOURce:DATA:TELecom:SONet:POINter:OFFSet:RATE <numeric><suffix>

Limitations: Default suffix now PPM, ratio no longer supported

Preferred: :SOURce:DATA:TELecom:SONet:POINter:OFFset:RATE <numeric>

See also:

The corresponding query returns the pointer offset rate in PPM.

:SOURce:DATA:TELecom:SONet:POINter:VALue <numeric>

Limitations: Also affects SDH pointer

Preferred: :SOURce:DATA:TELecom:SONet:POINter:NEW:VALue

See also:

The corresponding query returns the New Pointer Value in numeric form.

:SOURce:DATA:TELecom:SONet:POVerhead:J1 <string>

Limitations: Also affects SDH J1 string

Preferred: :SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern:B64

See also: :SOURce:DATA:TELecom:SDH:POVerhead:J1

The corresponding query returns the user defined 64 byte Path Overhead J1 data in string form.

:SOURce:DATA:TELecom:SONet:POVerhead:J1:CRC7 <string>

Limitations: Also affects SDH J1 CRC7 string

Preferred: :SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern:B16Crc

See also: :SOURce:DATA:TELecom:SDH:POVerhead:J1:CRC7

The corresponding query returns the user defined 15 Byte Path Overhead J1 CRC 7 data in string form.

:SOURce:DATA:TELecom:SONet:POVerhead:J1:HEXadecimal?

Returns <block>

Limitations:

Preferred: :SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern:Array?

See also:

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern <discrete>

Limitations: Affects SDH setting also

Older parameter values not supported	TEST	CRC7Test
Older parameter values supported	USER	CRC7User
New parameter values preferred	B64	B16Crc

The corresponding query returns the J1 pattern type in discrete form.

:SOURce:DATA:TELecom:SONet:PRBS:POLarity <discrete>

Limitations: Affects polarity of all PRBS patterns not just SONet

Preferred: :SOURce:DATA:TELecom:PATTern:POLarity

See also: :SOURce:DATA:TELecom:SDH:PRBS:POLarity

The corresponding query returns the PRBS Polarity in discrete form.

:SOURce:DATA:TELecom:SONet:STS12c <numeric>

Limitations:

Preferred: :SOURce:DATA:TELecom:SONet:STS3

See also:

The corresponding query returns the selected STS12C in numeric form.

:SOURce:DATA:TELecom:SONet:TFUNction:TYPE <discrete>

Limitations: Accepted but performs no function. Newer OmniBER instruments do not require Test Function Selection

Preferred: See earlier OmniBER commands listed in 'See also' below.

:SOURce:DATA:TELecom:TFUNction:DISable

See also: :SOURce:DATA:TELecom:TFUNction

:SOURce:DATA:TELecom:SONet:ALARm

:SOURce:DATA:TELecom:SONet:ERRor:TYPE

:SOURce:DATA:TELecom:SONet:MSPMessages:...

:SOURce:DATA:TELecom:SONet:POINter:...

:SOURce:DATA:TELecom:SONet:THRumode <discrete>

Limitations: Also affects through mode for other telecom types

Preferred: :SOURce:DATA:TELecom:THRu

See also: :SOURce:DATA:TELecom:SDH:THRumode

The corresponding query returns the Through Mode state in discrete form.

:SOURce:DATA:TELecom:SONet:SEQuence:DATA <discrete>,<string>

Limitations: Sequence element now specified by <numeric>. A discrete parameter of A-E will be mapped to 1-5.

Preferred: :SOURce:DATA:TELecom:SONet:SEQuence:DATA <numeric>,<string>

See also:

The corresponding query returns the data value of the specified element.

:SENSe:DATA

See Separate Section Below

:SENSe:DATA:TELecom

:SENSe:DATA:TELecom:TFUNction

Limitations: Parameter values not supported — PDHPayload, PDH, SDISruption, ATM, POS

Values accepted but perform no function — SDH, SONet

Preferred: :SOURce:DATA:TELecom:TFUNction:DISable

Test Function selection commands

See also: :SOURce:DATA:TELecom:SONet:ALARm

:SOURce:DATA:TELecom:SONet:ERRor:TYPE

:SOURce:DATA:TELecom:SONet:MSPMessages:...

:SOURce:DATA:TELecom:SONet:POINter:...

:SENSe:DATA:TELecom:TEST:PERiod <numeric><suffix>

Limitations: Different parameter types and increased functionality

:SENSe:DATA:TELecom:SDH

:SENSe:DATA:TELecom:SDH:AU4 <numeric>

Limitations:

Preferred: :SENSe:DATA:TELecom:SDH:AUG1
:SENSe:DATA:TELecom:SDH:AUG4

See also:

The corresponding query returns the AU4 in numeric form.

:SENSe:DATA:TELecom:SDH:AU4C <numeric>

Limitations:

Preferred: :SENSe:DATA:TELecom:SDH:AUG4

See also:

The corresponding query returns the AU4C in numeric form.

:SENSe:DATA:TELecom:SDH:MAPPing <discrete>

Limitations: Also affects SONet mapping
Parameter values not supported: M140
M34
DS3
ATM
IPOS

Preferred: :SENSe:DATA:TELecom:SDH:PAYLoad

See also: :SENSe:DATA:TELecom:SONet:MAPPing

The corresponding query returns the SDH Mapping in discrete form.

:SENSe:DATA:TELecom:SDH:PAYLoad <discrete>

Limitations: Parameter values not supported: M140
TU3 *or* M34
TU12 *or* M2
TU2

TU11 *or* DS1

Preferred: :SENSe:DATA:TELecom:SDH:PAYLoad
:SENSe:DATA:TELecom:SDH:TU

See also: :SENSe:DATA:TELecom:SDH:PAYLoad

Note: This command has been reused in newer OmniBER instruments and has a slightly different functionality. Backward compatibility has been retained by processing the older <discrete> values. However, the corresponding query returns the Payload type valid with the OmniBER OTN instrument.

:SENSe:DATA:TELecom:SDH:PAYLoad:PATTern <discrete>

Limitations: Affects all Payload Patterns not just SDH

Preferred: :SENSe:DATA:TELecom:PATTern:TYPe
:SENSe:DATA:TELecom:PATTern:TYPe:PRBS
:SENSe:DATA:TELecom:PATTern:TYPe:WORD
:SENSe:DATA:TELecom:PATTern:TYPe:WORD:PRESet

See also: :SENSe:DATA:TELecom:SONet:PAYLoad:PATTern

The corresponding query returns the Payload Pattern in discrete form.

:SENSe:DATA:TELecom:SDH:PAYLoad:UWORd <string>

Limitations: Also affects the Rx User Word for SONET

Preferred: :SENSe:DATA:TELecom:PATTern:TYPE:WORD:USER

See also: :SENSe:DATA:TELecom:SONet:PAYLoad:PATTern:UWORd

The corresponding query returns the User defined Word in string form.

:SENSe:DATA:TELecom:SDH:PRBS:POLarity <discrete>

Limitations: Affects polarity of all PRBS patterns not just SDH

Preferred: :SENSe:DATA:TELecom:PATTern:POLarity

See also: :SENSe:DATA:TELecom:SONet:PRBS:POLarity

The corresponding query returns the PRBS Polarity in discrete form.

:SENSe:DATA:TELecom:SDH:TCM:PATH <discrete>

Limitations: Parameter value not supported: LOW

Preferred: :SENSe:DATA:TELecom:SDH:TCM:APID:HPATh
:SENSe:DATA:TELecom:SDH:TCM:APID:LPATh

See also:

The corresponding query returns the Tandem Connection Path in discrete form.

:SENSe:DATA:TELecom:SDH:TFUNction:TYPE <discrete>

Limitations: Only acts to disable Test Functions

Parameter values not supported OCAPture
DDCC
PGRaph
OBERTest

Preferred:

See also: :SENSe:DATA:TELecom:TFUNction

:SENSe:DATA:TELecom:SONet

:SENSe:DATA:TELecom:SONet:MAPPing <discrete>

Limitations: Also affects SONet mapping

Parameter values not supported: M140
M34
DS3
ATM
IPOS

Preferred: :SENSe:DATA:TELecom:SONet:PAYLoad

See also: :SENSe:DATA:TELecom:SDH:MAPPing

The corresponding query returns the SDH Mapping in discrete form.

:SENSe:DATA:TELecom:SONet:PAYLoad <discrete>

Limitations: Parameter values not supported: M140
TU3 *or* M34
TU12 *or* M2
TU2
TU11 *or* DS1

Preferred: :SENSe:DATA:TELecom:SONet:PAYLoad
:SENSe:DATA:TELecom:SONet:TU

See also: :SENSe:DATA:TELecom:SONet:PAYLoad

Note: This command has been reused in newer OmniBER instruments and has a slightly different functionality. Backward compatibility has been retained by processing the older <discrete> values. However, the corresponding query returns the Payload type valid with the OmniBER OTN instrument.

:SENSe:DATA:TELecom:SONet:PAYLoad:PATTern <discrete>

Limitations: Affects all Payload Patterns not just SONET

Preferred: :SENSe:DATA:TELecom:PATTern:TYPe
:SENSe:DATA:TELecom:PATTern:TYPe:PRBS
:SENSe:DATA:TELecom:PATTern:TYPe:WORD
:SENSe:DATA:TELecom:PATTern:TYPe:WORD:PRESet

See also: :SENSe:DATA:TELecom:SDH:PAYLoad:PATTern

The corresponding query returns the Payload Pattern in discrete form.

:SENSe:DATA:TELecom:SONet:PAYLoad:UWORd <string>

Limitations: Also affects the Rx User Word for SONET

Preferred: :SENSe:DATA:TELecom:PATTern:TYPE:WORD:USER

See also: :SENSe:DATA:TELecom:SDH:PAYLoad:PATTern:UWORd

The corresponding query returns the User defined Word in string form.

:SENSe:DATA:TELecom:SONet:PRBS:POLarity <discrete>

Limitations: Affects polarity of all PRBS patterns not just SONET
Preferred: :SENSe:DATA:TELecom:PATTern:POLarity
See also: :SENSe:DATA:TELecom:SDH:PRBS:POLarity

The corresponding query returns the PRBS Polarity in discrete form.

:SENSe:DATA:TELecom:SONet:STS12c <numeric>

Limitations:
Preferred: :SENSe:DATA:TELecom:SONet:STS3
See also:

The corresponding query returns the selected STS12C in numeric form.

:SENSe:DATA:TELecom:SONet:TFUNction:TYPE <discrete>

Limitations: Only acts to disable Test Functions
Parameter values not supported
OCAPture
DDCC
PGRaph
OBERTest

Preferred:
See also: :SENSe:DATA:TELecom:TFUNction

:SYSTem:

:SYSTem:CONFiguration

Limitations: Block Data has different format
Only supported in short form - SYSTem:CONF

:SYSTem:TRIGGer

Limitations:

Preferred: :SYSTem:TRIGger:TRANsmit
:SYSTem:TRIGger:TRANsmit:FRAMe
:SYSTem:TRIGger:RECeive
:SYSTem:TRIGger:RECeive:FRAMe
:SYSTem:TRIGger:RECeive:ERRor
:SYSTem:TRIGger:RECeive:ERRor:OTN
:SYSTem:TRIGger:RECeive:ERRor:SDH:SECTion
:SYSTem:TRIGger:RECeive:ERRor:SDH:PATH
:SYSTem:TRIGger:RECeive:ERRor:SDH:TCM
:SYSTem:TRIGger:RECeive:ERRor:SONet:TRANsport
:SYSTem:TRIGger:RECeive:ERRor:SONet:PATH
:SYSTem:TRIGger:RECeive:ALARm
:SYSTem:TRIGger:RECeive:ALARm:OTN
:SYSTem:TRIGger:RECeive:ALARm:SDH:SECTion
:SYSTem:TRIGger:RECeive:ALARm:SDH:PATH
:SYSTem:TRIGger:RECeive:ALARm:SDH:TCM
:SYSTem:TRIGger:RECeive:ALARm:SONet:TRANsport
:SYSTem:TRIGger:RECeive:ALARm:SONet:PATH

Results Provided for Backward Compatibility

The following results are supported in the OmniBER OTN instruments but not recommended. Future developments should use the preferred results indicated.

ASEConds:SDH:LOP

Preferred: ASEConds:SDH:AULop

ASEConds:SDH:LOS

Preferred: ASEConds:LOS

ASEConds:SDH:PFERf

Preferred: ASEConds:SDH:HPRDi

ASEConds:SDH:RDI

Preferred: ASEConds:SDH:HPRDi

ASEConds:SONet:LOS

Preferred: ASEConds:LOS

ECOunt:SDH:FEBE

Preferred: ECOunt:SDH:HPRei

ECOunt:SDH:MFEBe

Preferred: ECOunt:SDH:MSRei

ECOunt:SDH:REI

Preferred: ECOunt:SDH:HPRei

ERATio:SDH:FEBE

Preferred: ERATio:SDH:HPRei

ERATio:SDH:MFEBe

Preferred: ERATio:SDH:MSRei

ERATio:SDH:REI

Preferred: ERATio:SDH:HPRei

G.826 ANALysis Results

SENSe:DATA? Results naming has been changed to allow for standards of analysis other then G.826, (e.g G.828). Consequently, SENSe:DATA? results generated in accordance with G.826 should be accessed using the preferred notation:

:SENSe:DATA? <string>

where <string> = **"<Result Type>:SDH|SONet:<Path Type>:G826"**

The older notation is supported but not recommended for future use:

:SENSe:DATA? <string>

where <string> = "<Result Type>:SDH|SONet:<Path Type>:ANALysis"

<Result Type> is one of the following:

ESEConds	SESeconds	BBECount	EBCount
ESRatio	SESRatio	BBERatio	
UASeconds	PUASeconds		

<Path Type> is one of the following:

SDH:

RSBip	MSBip	MSRei	PBIP
REI	TCM:PIEC	TCM:REI	

SONet:

CVL	CVP	CVS
REIL	REIP	

The following <Path Type> are also supported but not recommended for future use:

SDH:

FEBE	MFEFe	TCM:FEBE

OmniBER 718 Features/Commands Not Supported

This section details commands that are not supported in the OmniBER OTN instrument. Please refer to the OmniBER 718 remote control manual for details of the commands indicated.

For a command ending in "<>" , this indicates that all parameters of a single command are relevant. For a command ending in ":" , this indicates that all commands starting with this root are relevant. For a command where a single parameter is indicated "<parameter>", only this parameter is relevant.

Alarm Scan

The 37718 Alarm Scan feature is superceded by the Signal Wizard feature.

FETCh:ARRay:DATA:TELecom:SDH:ASCan?
FETCh:ARRay:DATA:TELecom:SONet:ASCan?
SENSe:DATA:TELecom:SDH:ASCan<>
SENSe:DATA:TELecom:SDH:ASCan:
SENSe:DATA:TELecom:SONet:ASCan<>
SENSe:DATA:TELecom:SDH:ASCan:
SENSe:DATA:TELecom:SPDH:ASCan<>

ATM

SENSe:DATA:TELecom:ATM:
SOURce:DATA:TELecom:ATM:
SOURce:DATA:TELecom:TFUNction<ATM>
SOURce:DATA:TELecom:SDH:MAPPing <ATM>
SOURce:DATA:TELecom:SONet:MAPPing <ATM>
SENSe:DATA:TELecom:TFUNction <ATM>
SENSe:DATA:TELecom:SONet:MAPPing <ATM>

Packet over SONET

SENSe:DATA:TELecom:IPOS:
SOURce:DATA:TELecom:IPOS:
SOURce:DATA:TELecom:TFUNction<POS>
SOURce:DATA:TELecom:SDH:MAPPing <IPOS>
SOURce:DATA:TELecom:SONet:MAPPing <IPOS>
SENSe:DATA:TELecom:TFUNction <POS>
SENSe:DATA:TELecom:SONet:MAPPing <IPOS>

Jitter

FETCh:ARRay:DATA:TELecom:JITTer:
OUTPut:TELecom:JITTer<>
SENSe:DATA:TELecom:JITTer:
SOURce:DATA:TELecom:JITTer:
SYSTem:PRINt:CONTent:JITTer<>

Pointer Sequences

SOURce:DATA:TELecom:SDH:POINter:G783<>
SOURce:DATA:TELecom:SDH:POINter:G783:
SOURce:DATA:TELecom:SONet:POINter:T1105:
SOURce:DATA:TELecom:SONet:POINter:T1105<>

Optical Stress Test

SOURce:DATA:TELecom:SDH:STESt:
SOURce:DATA:TELecom:SONet:STESt:

Suppression of results

SENSe:DATA:TELecom:SDH:MSRei<>
SENSe:DATA:TELecom:SONet:REIL<>
SENSe:DATA:TELecom:SDH:MSAis<>
SENSe:DATA:TELecom:SONET:MSAis<>

Short term gating

A short term period is not settable - counts and ratios in the last second are available instead.

SENSe:DATA:TELecom:STERm:PERiod<>

Protected Monitor points

OUTPut:TELecom:OC12:INTerface?
OUTPut:TELecom:OC3:INTerface?
OUTPut:TELecom:OC48:INTerface?
OUTPut:TELecom:OPT16:INTerface?
OUTPut:TELecom:OPT1:INTerface?
OUTPut:TELecom:OPT4:INTerface?
:INPut:TELecom:OC3:INTerface <MONitor>
:INPut:TELecom:OC12:INTerface <MONitor>
:INPut:TELecom:OC48:INTerface <MONitor>
:INPut:TELecom:OPT1:INTerface <MONitor>
:INPut:TELecom:OPT4:INTerface <MONitor>
:INPut:TELecom:OPT16:INTerface <MONitor>
SOURce:CLOCk:SDH:SOURce <RMON0,RMON1,RMON4>
SOURce:CLOCk:SONet:SOURce <RMN1,RMN3,RMN12>

64kbit/s external clock format

:SOURce:CLOCk:SDH:FORMat <K64>
:SOURce:CLOCk:SONet:FORMat <K64>

Overhead BER

SENSe:DATA:TELecom:SDH:OBERtest:
SENSe:DATA:TELecom:SONet:OBERtest:
SOURce:DATA:TELecom:SDH:OBERtest:
SOURce:DATA:TELecom:SDH:OBERtest<>
SOURce:DATA:TELecom:SONet:OBERtest:
SOURce:DATA:TELecom:SONet:OBERtest<>
SENSe:DATA:TELecom:SDH:TFUNction:TYPE <OBERTest>

SENSe:DATA:TELecom:SONet:TFUNction:TYPE <OBERTest>

Thru mode payload overwrite

:SOURce:DATA:TELecom:SDH:THRumode:PAYLoad:OVERwrite:
:SOURce:DATA:TELecom:SONet:THRumode:PAYLoad:OVERwrite:

Other commands

SYSTem:WINDow<>

This command is not applicable to the OmniBER OTN Graphical User Interface.

OmniBER 718 SENSe:DATA Results Not Supported (Feature not in OmniBER OTN)

The following results or groups of results from OmniBER 718 instruments are not supported in the OmniBER OTN:

ATM

ASEConds:IPOS:
ECOunt:IPOS:
ERATio:IPOS:
SDTest:IPOS:

Packet over SONET

ASEConds:IPOS:
ECOunt:IPOS:
ERATio:IPOS:
SDTest:IPOS:

Jitter

COUNt:JITT:HITS
COUNt:JITT:WANDer:SEConds:TIERror
COUNt:JITT:WANDer:TIERror
FOFPpm:JITT:WANDer:IMPLied
FSEConds:JITT:HITS
PEAK:JITT:
RMS:JITT
RMS:JITT:STERm
SEConds:JITT:HITS
SLIPs:JITT:WANDer:BIT
SLIPs:JITT:WANDer:FRAMe

Overhead BER

ASEConds:SDH:OPSL
ASEConds:SONet:OPSL

Backwards Compatibility

OmniBER 718 SENSe:DATA Results Not Supported

ECOunt:SONet:OVERhead
ECOunt:SDH:OVERhead

OmniBER 718 features with no SCPI support

This section details features present in the OmniBER OTN and OmniBER 718 that no longer have SCPI support in the OmniBER OTN. Please refer to the OmniBER 718 remote control manual for details of the commands indicated.

Trouble Scan

FETCh:ARRay:DATA:TELecom:SDH:TSCan?
FETCh:ARRay:DATA:TELecom:SONet:TSCan?
SENSe:DATA:TELecom:SDH:TSCan
SENSe:DATA:TELecom:SONet:TSCan
SENSe:DATA:TELecom:TSCan

Printer Control

SYSTem:PRINt:

Floppy Disk Control

SYSTem:DISK:

Keyboard lock

SYSTem:KLOCk

Beep on error

SYSTem:BEEPer:STATe

Stored Settings label

SYSTem:SSETting:LABel
SYSTem:SSETting:LOCK

Selftest Wavelength selection

SYSTem:SELFtest:WAVelength

Workarounds for Incompatible OmniBER 718 Commands

This section details commands that are not supported in the OmniBER OTN instrument but a workaround exists. The workaround is shown in *italics*.

J0/J1/TCM Trace messages

FETCh:STRing:DATA:TELecom:SDH:J0:HEXadecimal?
Use `FETCh:STRing:DATA:TELecom:SDH:J0?`

FETCh:STRing:DATA:TELecom:SDH:J1:HEXadecimal?
Use `FETCh:STRing:DATA:TELecom:SDH:J1?`

FETCh:STRing:DATA:TELecom:SONet:J0:HEXadecimal?
Use `FETCh:STRing:DATA:TELecom:SONET:J0?`

FETCh:STRing:DATA:TELecom:SONet:J1:HEXadecimal?
Use `FETCh:STRing:DATA:TELecom:SONET:J1?`

SOURce:DATA:TELecom:SDH:OVERhead:J0:HEX?
Use SOURce:DATA:TELecom:SDH:OVERhead:J0?

SOURce:DATA:TELecom:SDH:POVerhead:J1:HEX?
Use SOURce:DATA:TELecom:SDH:POVerhead:J1?

SOURce:DATA:TELecom:SONET:OVERhead:J0:HEX?
Use SOURce:DATA:TELecom:SONET:OVERhead:J0?

SOURce:DATA:TELecom:SONET:POVerhead:J1:HEX?
Use SOURce:DATA:TELecom:SONET:POVerhead:J1?

SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern <TEST>
SOURce:DATA:TELecom:SDH:POVERhead:J1:PATTern <TEST>
SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern <TEST>

SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern<TEST,CRC7Test>
SENSe:DATA:TELecom:SDH:POVerhead:J1:PATTern <TEST,CRC7Test>
SENSe:DATA:TELecom:SDH:TCM:APID:PATTern <DEFault, TEST>
SENSe:DATA:TELecom:SONet:OVERhead:J0:PATTern <TEST>
SENSe:DATA:TELecom:SONet:POVerhead:J1:PATTern <TEST, CRC7Test>
Choose an alternative parameter.

Frequency offset not settable in %

SOURce:CLOCk:SDH:FOFFset:OFFSet <numeric><PCT>
SOURce:DATA:TELecom:SONet:POINter:OFFSet:RATE <numeric><PCT>
Set offset in ppm

Overhead Sequences

:SOURce:DATA:TELecom:SDH:SEQuence:OHBYte Z1/Z2
:SOURce:DATA:TELecom:SDH:SEQuence:COLumn <numeric>
:SENSe:DATA:TELecom:SDH:OCAPture:OHBYte Z1/Z2
:SENSe:DATA:TELecom:SDH:OCAPture:COLumn <numeric>
Instead of Z1/Z2, use Xrc (for example, X92) notation to specify the overhead sequence channel.

Overhead Sequences

:SOURce:DATA:TELecom:SDH:SEQuence:DATA<>
:SOURce:DATA:TELecom:SONet:SEQuence:DATA<>
Use numeric 1 to 256 instead of A,B,C,D,E
:SOURce:DATA:TELecom:SDH:SEQuence:ORDer
:SOURce:DATA:TELecom:SONet:SEQuence:ORDer
Repeat elements in sequence data to generate required repetition

Workarounds for Incompatible OmniBER 718 SENSe:DATA Results

Frequency measurement

FOFHz:SDH[:GATE16S]
FOFHz:SONet[:GATE16S]
Use FOF

FOFPpm:SDH[:GATE16S]
FOFPpm:SONet[:GATE16S]
Use FOFPpm

FREQuency:SDH:GATE1S
FREQuency:SONet:GATE1S
FREQuency:SDH[:GATE16S]
FREQuency:SONet[:GATE16S]
Use FREQuency

Short term results

STERm

ECOunt:SDH:STERm:
Use ECOunt:SDH:LSECond:

ECOunt:SONet:STERm:
Use ECOunt:SONET:LSECond:

ECOunt:STERm:BIT
Use ECOunt:LSECond:BIT

ERATio:SDH:STERm:
Use ERATio:SDH:LSECond:

ERATio:SONet:STERm:
Use ERATio:SONET:LSECond:

ERATio:STERm:BIT
Use ERATio:LSECond:BIT

Backwards Compatibility of STATus commands

This section summarizes differences between the STATus commands of the OmniBER OTN and the OmniBER 718.

Commands

The following generic commands are common to both OmniBER 718 and OmniBER OTN instruments:

```
:STATus:<register>:CONDition?
:STATus:<register>:ENABle
:STATus:<register>:ENABle?
:STATus:<register>:EVENt?
:STATus:<register>:NTRansition
:STATus:<register>:NTRansition?
:STATus:<register>:PTRansition
:STATus:<register>:PTRansition?
```

The following commands are not supported with the OmniBER OTN instruments:

```
:STATus:<register>:HISTory
:STATus:<register>:HISTory?
```

Non Supported Registers

As a result in the difference in functionality the following status registers used in OmniBER 718 instruments are not provided in the OmniBER OTN instruments:

- ATM Status Register
- IPOS Status Register
- JITTer Status Register
- SPDH Status Register
- M140 Status Register
- M34 Status Register
- M8 Status Register
- M2 Status Register
- DS3 Status Register
- DS2 Status Register
- DS1 Status Register

The addition of functionality to the OmniBER OTN has necessitated the addition of STATus registers to handle the need for additional status bits. This has also resulted in some rationalization of the status bits relative to the OmniBER 718 product.

Reused Registers

Please refer to the appropriate instrument SCPI manuals for details of the STATus registers.

The following diagrams of the OmniBER 718 STATus registers provide an indication the reuse:

Bits in **bold** typeface indicate STATus bits reused in the OmniBER OTN,
Bits in **Inverse** typeface indicate STATus bits with different use in the OmniBER OTN.

DATA Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	**ISUM**	-	-	IPOS	SDH3	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	ATM	**SPDH**	JITT	SDH2	**SDH**	FAS	-

DB2: This bit has been renamed but provides a similar combined SDH/SONET register summary on OmniBER 718 instruments.

ISUMmary Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	**ERR**	**PSL**	-	-	-	-	IPOS

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
ATM	-	LOP	FAR	AIS	**LOF**	**LOS**	**PLO**

DB2: Provides a Frame Alarm (LOF / OOF) indication on OmniBER 718 instruments.

SDH Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	ERR	**LPRDI**	**TUAIS**	**TULOP**	**HPRDI**	**MSRDI**	**H4**

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
CSL	PSL	**AUAIS**	**MSAIS**	**LOP**	**OOF**	**LOF**	LOS

SDH2 Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	BDL	BCL	PSA	RAS	TAS	PSI	**FMU**

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
ALSC	**K1K2**	**TMNDF**	**TNDF**	**TPADJ**	**MNDF**	**NDF**	**PADJ**

DB7: This bit provides an indication of Signal Wizard in Progress (SIGW) on OmniBER 718 instruments.

SDH3 Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	FMU_1S

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	**TCODI**	**TCRDI**	**TCIAIS**	**TCLOM**	**P1P0**

SONet Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	ERR	**RDIV**	**AISV**	**LOPV**	**RDIP**	**RDIL**	**H4**

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
CSL	PSL	**AISP**	**AISL**	**LOPP**	**SEF**	**LOF**	LOS

SONet2 Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	BDL	BCL	PSA	RAS	TAS	PSI	**FMU**

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0

Backwards Compatibility of STATus commands

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
ALSC	**K1K2**	**TMNDF**	**TNDF**	**TPADJ**	**MNDF**	**NDF**	**PADJ**

SONet3 Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	FMU_1S

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	-	**P1P0**

Backwards Compatibility for Enhanced Testing Upgrade Commands

The following commands are not available at initial release, but are expected to be provided with Enhanced Testing Upgrade, (J7265A option 500)

Pointer Graph

FETCh:ARRay:DATA:TELecom:SDH:PGRaph?
FETCh:ARRay:DATA:TELecom:SONet:PGRaph?
SENSe:DATA:TELecom:SDH:PGRaph:
SENSe:DATA:TELecom:SONet:PGRaph:
SENSe:DATA:TELecom:SONet:TFUNction:TYPE <PGRaph>
SENSe:DATA:TELecom:SDH:TFUNction:TYPE <PGRaph>

Service Disruption

SENSe:DATA:TELecom:TFUNction:SDISruption<>
SOURce:DATA:TELecom:TFUNction:SDISruption<>

VT/TU mappings

SOURce:DATA:TELecom:SDH:TUG3:BACKground:
SOURce:DATA:TELecom:SONet:STS12c:BACKground<>
SOURce:DATA:TELecom:SONet:STS3:BACKground<>
SENSe:DATA:TELecom:SDH:PRIMary:
SENSe:DATA:TELecom:SONet:PRIMary:
SOURce:DATA:TELecom:SDH:PRIMary:
SOURce:DATA:TELecom:SONet:PRIMary:
FETCh:SCALar:DATA:TELecom:SDH:TRIButary:
FETCh:SCALar:DATA:TELecom:SONet:TRIButary:
FETCh:STRing:DATA:TELecom:SDH:TRIButary:
FETCh:STRing:DATA:TELecom:SONet:TRIButary:
SENSe:DATA:TELecom:SDH:TRIButary:
SENSe:DATA:TELecom:SONet:TRIButary:
SOURce:DATA:TELecom:SDH:TRIButary:

SOURce:DATA:TELecom:SONet:TRIButary:
FETCh:SCALar:DATA:TELecom:SDH:POVerhead:H4Sequence<>
FETCh:SCALar:DATA:TELecom:SONet:POVerhead:H4Sequence<>
FETCh:STRing:DATA:TELecom:SDH:TCM:APID?
SENSe:DATA:TELecom:SDH:PAYLoad:STRucture<>
SENSe:DATA:TELecom:SDH:PAYLoad:TYPE<>
SENSe:DATA:TELecom:SONet:PAYLoad:STRucture<>
SENSe:DATA:TELecom:SONet:PAYLoad:TYPE<>
SENSe:DATA:TELecom:SDH:TCM:PATH<LOW>
SOURce:DATA:TELecom:SDH:TCM:PATH<LOW>
SENSe:DATA:TELecom:SONet:TRIButary<>
SENSe:DATA:TELecom:SONet:TRIButary:
SOURce:DATA:TELecom:SDH:PAYLoad:OFFSet<>
SOURce:DATA:TELecom:SDH:PAYLoad:STRucture<>
SOURce:DATA:TELecom:SDH:PAYLoad:TYPE<>
SOURce:DATA:TELecom:SDH:PDHPayload:ERRor:TYPE<>
SOURce:DATA:TELecom:SDH:POVerhead:H4Sequence<>
SOURce:DATA:TELecom:SONet:PAYLoad:OFFSet<>
SOURce:DATA:TELecom:SONet:PAYLoad:STRucture<>
SOURce:DATA:TELecom:SONet:PAYLoad:TYPE<>
SOURce:DATA:TELecom:SONet:PDHPayload:ERRor:TYPE<>
SOURce:DATA:TELecom:SONet:POVerhead:H4Sequence<>
SOURce:DATA:TELecom:SONet:TRIButary<>
SOURce:DATA:TELecom:SONet:TRIButary:
SOURce:DATA:TELecom:SONet:ALARm <LOPV, AISV, RDIV, LOMultiframe, VTUNequiped>
SOURce:DATA:TELecom:SONet:ERRor:TYPE <REIV, CVV>
SOURce:DATA:TELecom:SONet:MAPPing <M140, M34, DS3>
SOURce:DATA:TELecom:SONet:PAYLoad <M140, TU3, M34, TU12, M2, TU2, TU11, DS1>
SOURce:DATA:TELecom:SDH:MAPPing <M140, M34, DS3>
SENSe:DATA:TELecom:SDH:PAYLoad < M140, TU3, M34, TU12, M2, TU2, TU11, DS1>
SENSe:DATA:TELecom:SDH:POINter:OFFSet <TU>
SENSe:DATA:TELecom:SONet:MAPPing <M140, M34, DS3>
SENSe:DATA:TELecom:SONet:PAYLoad < M140, TU3, M34, TU12, M2, TU2, TU11, DS1>
SENSe:DATA:TELecom:SONet:POINter:OFFSet <VT>
SOURce:DATA:TELecom:SDH:TCM:APID:PATTern <DEFAULT, TEST>

Backwards Compatibility for Enhanced Testing Upgrade Commands

SONET/SDH Electrical Interfaces

INPut:TELecom:SDH:GAIN<>

INPut:TELecom:SONet:GAIN<>

OUTPut:TELecom:SDH:LEVel<>

OUTPut:TELecom:SONet:LEVel

SENSe:DATA:TELecom:SENSe <SDH or SONet>

SOURce:DATA:TELecom:SOURce <SDH or SONet>

PDH/DSn

FETCh:ARRay:DATA:TELecom:SPDH:

FETCh:SCALar:DATA:TELecom:SPDH:

FETCh:STRing:DATA:TELecom:SPDH:

INPut:TELecom:SPDH:

OUTPut:TELecom:SPDH:

SENSe:DATA:TELecom:SPDH:

SOURce:CLOCk:SPDH:

SOURce:DATA:TELecom:SPDH:

SENSe:DATA:TELecom:SENSe <PDH>

SOURce:DATA:TELecom:SOURce <PDH>

SOURce:DATA:TELecom:TFUNction<PDH, PDHPayload, SDISruption>

SOURce:DATA:TELecom:SDH:ALARm <TULop, TUPais, LPRDi. LOMultiframe, TUUNequiped>

SOURce:DATA:TELecom:SDH:ERRor:TYPE <TCBip,TUBip>

SOURce:DATA:TELecom:SDH:MAPPing <M140,M34,DS3>

SOURce:DATA:TELecom:SDH:PAYLoad <M140, TU3, M34, TU12, M2, TU2, TU11, DS1>

SENSe:DATA:TELecom:TFUNction < PDH, PDHPayload, SDISruption >

External clock level

SOURce:CLOCk:SDH:LEVel<>

SOURce:CLOCk:SONet:LEVel<>

Stored Measurement Graphics

SENSe:DATA:TELecom:SMG<>

SENSe:DATA:TELecom:SMG:

Backwards Compatibility

Backwards Compatibility for Enhanced Testing Upgrade Commands

Thru mode overhead overwrite

SOURce:DATA:TELecom:SDH:THRumode:COVerwrite<>
SOURce:DATA:TELecom:SONet:THRumode:COVerwrite<>

Active APS

SOURce:DATA:TELecom:SDH:MSPMessages:TOPology:
SOURce:DATA:TELecom:SONet:APSMessages:TOPology:

Logging

SYSTem:LOGGing:DEVice

Backwards Compatibility for Enhanced Testing Upgrade Results

The following SENSe DATA? Results are not available at initial release, but are expected to be provided with Enhanced Testing Upgrade, (J7265A option 500)

VT/TU Mappings

TRIB
ASEConds:SDH:TRIB:
BBECount:SDH:TRIB:<>:ANALysis
BBERatio:SDH:TRIB:<>:ANALysis
EBCount:SDH:TRIB:<>:ANALysis
EBCount:SONet:TRIB:<>:ANALysis
ECOunt:SDH:TRIB:
ECOunt:SONet:TRIB:
ERATio:SDH:TRIB:
ERATio:SONet:TRIB:
ESEConds:SDH:TRIB:<>:ANALysis
ESEConds:SONet:TRIB:<>:ANALysis
ESRatio:SDH:TRIB<>:ANALysis
ESRatio:SONet:TRIB:<>:ANALysis
PACTivity:SDH:TRIButary:
PACTivity:SONet:TRIButary:
PUASeconds:SDH:TRIB:<>:ANALysis
PUASeconds:SONet:TRIB:<>:ANALysis
SESRatio:SDH:TRIB:<>:ANALysis
SESRatio:SONet:TRIB:<>:ANALysis
SESeconds:SDH:TRIB:<>:ANALysis
SESeconds:SONet:TRIB:<>:ANALysis
UASeconds:SDH:TRIB:<>:ANALysis
UASeconds:SONet:TRIB:<>:ANALysis

SDH
ASEConds:SDH:H4MF
SONet
ASEConds:SONet:H4MF

PDH/DSn

SPDH
ASEConds:SPDH:
BBECount:SPDH:<>:<>:ANALysis:G826

BBERatio:SPDH:<>:<>:ANALysis:G826
DAY7:SPDH:ANALysis:M2110
DMINutes:SPDH:<>:ANALysis
DMINutes:SPDH:<>:FAS:ANALysis
EBCount:SPDH:<>:<>:ANALysis:G826
ECOunt:SPDH:
EFSeconds:SPDH:<>:ANALysis
EFSeconds:SPDH:<>:FAS:ANALysis
ERATio:SPDH:
ESEConds:SPDH:BIT:ANALysis
ESEConds:SPDH:BIT:RECeive:ANALysis:G826
ESEConds:SPDH:<>:ANALysis
ESEConds:SPDH:<>:RECeive:ANALysis:G826
ESEConds:SPDH:<>:TRANsmit:ANALysis:G826
ESEConds:SPDH:<>:FAS:ANALysis
ESRatio:SPDH:<>:RECeive:ANALysis:G826
ESRatio:SPDH:<>:TRANsmit:ANALysis:G826
FOFHz:SPDH
FOFPpm:SPDH
FREQuency:SPDH
HOUR1:SPDH:ANALysis:M2110
HOUR24:SPDH:ANALysis:M2110
HOUR2:SPDH:ANALysis:M2110
MIN15:SPDH:ANALysis:M2110
PDMinutes:SPDH:<>:ANALysis
PDMinutes:SPDH:<>:FAS:ANALysis
PEFSeconds:SPDH:<>:ANALysis
PEFSeconds:SPDH:<>:FAS:ANALysis
PESD:SPDH:BIT:ANALysis
PESeconds:SPDH:<>:ANALysis
PESeconds:SPDH:<>:FAS:ANALysis
PSESeconds:SPDH:<>:ANALysis
PSESeconds:SPDH:<>:FAS:ANALysis
PUASeconds:SPDH:<>:ANALysis
PUASeconds:SPDH:<>:RECeive:ANALysis:G826
PUASeconds:SPDH:<>:TRANsmit:ANALysis:G826
PUASeconds:SPDH:<>:FAS:ANALysis
RTDelay:SPDH:COUNt
SESRatio:SPDH:<>:RECeive:ANALysis:G826
SESRatio:SPDH:<>:TRANsmit:ANALysis:G826
SESeconds:SPDH:<>:ANALysis

	SESeconds:SPDH:<>:RECeive:ANALysis:G826
	SESeconds:SPDH:<>:TRANsmit:ANALysis:G826
	SESeconds:SPDH:<>:FAS:ANALysis
	UASeconds:SPDH:<>:ANALysis
	UASeconds:SPDH:<>:RECeive:ANALysis:G826
	UASeconds:SPDH:<>:FAS:ANALysis
PDH	ECOunt:PDH:CRC

G.821 analysis

Other	DMINutes:BIT:ANALysis
	EFSeconds:BIT:ANALysis
	ESEConds:BIT:ANALysis
	PDMinutes:BIT:ANALysis
	PEFSeconds:BIT:ANALysis
	PESeconds:BIT:ANALysis
	PSESeconds:BIT:ANALysis
	PUASeconds:BIT:ANALysis
	SESeconds:BIT:ANALysis
	UASeconds:BIT:ANALysis

G.826 analysis of bit errors and TCM errors and OEI

BBECount:SDH:BLKBit:ANALysis
BBECount:SDH:TCM:ERR:ANALysis
BBECount:SDH:TCM:OEI:ANALysis
BBECount:SONet:BLKBit:ANALysis
BBERatio:SDH:BLKBit:ANALysis
BBERatio:SDH:TCM:ERR:ANALysis
BBERatio:SDH:TCM:OEI:ANALysis
BBERatio:SONet:BLKBit:ANALysis
EBCount:SDH:BLKBit:ANALysis
EBCount:SDH:TCM:ERR:ANALysis
EBCount:SDH:TCM:OEI:ANALysis
EBCount:SONet:BLKBit:ANALysis
ESEConds:SDH:BLKBit:ANALysis
ESEConds:SDH:TCM:ERR:ANALysis
ESEConds:SDH:TCM:OEI:ANALysis
ESEConds:SONet:BLKBit:ANALysis

ESRatio:SDH:BLKBit:ANALysis
ESRatio:SDH:TCM:ERR:ANALysis
ESRatio:SDH:TCM:OEI:ANALysis
ESRatio:SONet:BLKBit:ANALysis
PUASeconds:SDH:TCM:ERR:ANALysis
SESRatio:SDH:BLKBit:ANALysis
SESRatio:SDH:TCM:ERR:ANALysis
SESRatio:SDH:TCM:OEI:ANALysis
SESRatio:SONet:BLKBit:ANALysis
SESeconds:SDH:BLKBit:ANALysis
SESeconds:SDH:TCM:ERR:ANALysis
SESeconds:SDH:TCM:OEI:ANALysis
SESeconds:SONet:BLKBit:ANALysis
UASeconds:SDH:BLKBit:ANALysis
UASeconds:SDH:TCM:ERR:ANALysis
UASeconds:SDH:TCM:OEI:ANALysis
UASeconds:SONet:BLKBit:ANALysis

M.2100/M.2101 Analysis

M2100	ESEConds:SPDH:<>:<>:ANALysis:M2100
	SESeconds:SPDH:<>:<>:ANALysis:M2100
	UASeconds:SPDH:<>:<>:ANALysis:M2100
M2101	ESEConds:SDH:<>:<>:ANALysis:M2101
	SESeconds:SDH:<>:<>::ANALysis:M2101
	SESeconds:SONet:<>:<>:ANALysis:M2101
	UASeconds:SDH:<>:<>:ANALysis:M2101
	UASeconds:SONet:<>:<>:ANALysis:M2101
M2120	TR1:SPDH:RECeive:ANALysis:M2120
	TR1:SPDH:TRANsmit:ANALysis:M2120
	TR2:SPDH:RECeive:ANALysis:M2120
	TR2:SPDH:TRANsmit:ANALysis:M2120

General Information

General Information

This chapter contains general remote control information.

- **SCPI Overview** - Gives a brief overview of the SCPI Standard.
- **GPIB Universal Commands** - Describes the GPIB Universal commands.

SCPI Overview

Standard Commands for Programmable Instruments (SCPI) is a standard of the SCPI Consortium that provides guidelines for remote programming commands for instruments. The goal of SCPI is to reduce Automatic Test Equipment (ATE) program development time. It accomplishes this by providing a consistent programming environment for instrument control and data usage. This programming environment uses defined programming messages, instrument responses, and data formats across all SCPI instruments, regardless of manufacturer.

SCPI is based on two IEEE standards:

- *ANSI/IEEE Standard 488.1-1987*, IEEE Standard Digital Interface for Programmable Instrumentation
- *ANSI/IEEE Standard 488.2*-1987, IEEE Standard Codes, Formats, Protocols, and Common Commands. For use with ANSI/IEEE Standard 488.1-1987, IEEE Standard Digital Interface for Programmable Instrumentation

GPIB Universal Commands

The Required Commands perform the most basic remote functions over GPIB and are common to all GPIB controllable instruments. The commands are as follows:-

- DEVICE CLEAR
- SERIAL POLL
- REMOTE ENABLE
- LOCAL LOCKOUT
- GO TO LOCAL

Device Clear (CLEAR)

This command will initialize the instrument GPIB hardware.

The command format using HP 200/300 Series Basic, for example is:

CLEAR 705 (where 7 is the Bus I/O select code and 05 is the device address).

Serial Poll (SPOLL)

A serial poll will retrieve the value of the primary status byte. This byte contains useful information about the current state of the instrument.

for example:

SPOLL(705) (where 7 is the Bus I/O select code and 05 is the device address).

Remote Enable (REMOTE)

The Remote command instructs the instrument to enter the REMOTE state and be ready to accept instructions via GPIB.

When the Instrument receives this command it illuminates the front panel REMOTE indicator.

for example:

REMOTE 705 (where 7 is the Bus I/O select code and 05 is the device address).

Local Lockout (LOCAL LOCKOUT)

It is recommended that the Local Lockout command is sent after the Remote command. This disables the front panel local key preventing the return to local mode and thus any interference to the instrument settings.

It should always be preceded by the REMOTE command.

for example:

LOCAL LOCKOUT 7 (will configure all the instruments on the bus to the Local Lockout condition.)

NOTE If the instrument has been set to the LOCAL LOCKOUT condition, then the front panel LOCAL key is disabled. The instrument can only be returned to LOCAL operation by the controller sending the LOCAL command or by cycling power to the instrument.

Local (LOCAL)

The Local command returns the instrument from Remote operation to local front panel control.

for example:

LOCAL 7 or LOCAL 705 (where 7 is the Bus I/O select code and 05 is the device address).

SCPI Error Messages

SCPI Error Messages

The system-defined error/event numbers are chosen on an enumerated ("1 of N") basis. The SCPI defined error/event numbers and the error description portions of the ERRor query response are listed here. The first error/event described in each class (for example, -100, -200, -300, -400) is a "generic" error. In selecting the proper error/event number to report, more specific error/event codes are preferred, and the generic error/event is used only if the others are inappropriate.

No Error

This message indicates that the device has no errors.

No Error

The queue is completely empty. Every error/event in the queue has been read or the queue was purposely cleared by power-on, *CLS, etc.

Command Errors [-199, -100]

An < error/event number > in the range [-199, -100] indicates that an IEEE 488.2 syntax error has been detected by the instrument's parser. The occurrence of any error in this class should cause the command error bit (bit 5) in the event status register (*IEEE 488.2*, section 11.5.1) to be set. One of the following events has occurred:

- An *IEEE 488.2* system error has been detected by the parser. That is, a controller-to-device message was received which is in violation of the *IEEE 488.2* standard. Possible violations include a data element which violates the device listening formats or whose type is unacceptable to the device.

- An unrecognized header was received. Unrecognized headers include incorrect device-specific headers and incorrect or not implemented *IEEE 488.2* common commands.
- A Group Execute Trigger (GET) was entered into the input buffer inside of an *IEEE 488.2* < PROGRAM MESSAGE >.

Events that generate command errors shall not generate execution errors, device-specific errors, or query errors.

-100 Command error

This is the generic syntax error for devices that cannot detect more specific errors. This code indicates only that a Command Error as defined in IEEE 488.2, 11.5.1.1.4 has occurred.

-101 Invalid character

A syntactic element contains a character which is invalid for that type; for example, a header containing an ampersand, SET UP&. This error might be used in place of errors -114, -121, -141, and perhaps some others.

-102 Syntax error

An unrecognized command or data type was encountered; for example, a string was received when the device does not accept strings.

-103 Invalid separator

The parser was expecting a separator and encountered an illegal character; for example, the semicolon was omitted after a program message unit, *ESE 1:OUTP1:TEL:RATE 140 Mb/s

-104 Data type error

The parser recognized a data element different than one allowed; for example, numeric or string data was expected but block data was encountered.

-105 **GET not allowed**

A Group Execute Trigger was received within a program message (see IEEE 488.2, 7.7).

-108 **Parameter not allowed**

More parameters were received than expected for the header; for example, the *RCL common command only accepts one parameter, so receiving *RCL 0,1 is not allowed.

-109 **Missing parameter**

Fewer parameters were received than required for the header; for example, the *ESE common command requires one parameter, so receiving *ESE is not allowed.

-110 **Command header error**

An error was detected in the header. This error message should be used when the device cannot detect the more specific errors described for errors -111 through -119.

-111 **Header separator error**

A character which is not a legal header separator was encountered while parsing the header; for example, no white space followed the header, thus *ESE1 is an error.

-112 **Program mnemonic too long**

The header contains more that twelve characters (see IEEE 488.2, 7.6.1.4.1).

-113 **Undefined header**

The header is syntactically correct, but it is undefined by this specific device; for example, *XYZ is not defined for any device.

-114 **Header suffix out of range**

Indicates that a non-header character has been encountered in what the parser expects is a header element.

-120 **Numeric data error**

This error, as well as errors -121 through -129, are generated when parsing a data element which appears to be numeric, including the non-decimal numeric types. This particular error message should be used if the device cannot detect a more specific error.

-121 **Invalid character in number**

An invalid character for the data type being parsed was encountered; for example, an alpha in a decimal numeric or a "9" in octal data.

-123 **Exponent too large**

The magnitude of the exponent was larger than 32000 (see IEEE 488.2, 7.7.2.4.1).

-124 **Too many digits**

The mantissa of a decimal numeric data element contained more than 255 digits excluding leading zeros (see IEEE 488.2, 7.7.2.4.1).

-128 **Numeric data not allowed**

A legal numeric data element was received, but the device does not accept one in this position for the header.

-130 **Suffix error**

This error, as well as errors -131 through -139, are generated when parsing a suffix. This particular error message should be used if the device cannot detect a more specific error.

-131 **Invalid suffix**

The suffix does not follow the syntax described in IEEE 488.2, 7.7.3.2, or the suffix is inappropriate for this device.

-134 **Suffix too long**

The suffix contained more than 12 characters (see IEEE 488.2, 7.7.3.4).

-138 **Suffix not allowed**

A suffix was encountered after a numeric element which does not allow suffixes.

-140 **Character data error**

This error, as well as errors -141 through -149, are generated when parsing a character data element. This particular error message should be used if the device cannot detect a more specific error.

-141 **Invalid character data**

Either the character data element contains an invalid character or the particular element received is not valid for the header.

-144 **Character data too long**

The character data element contains more than twelve characters (see IEEE 488.2, 7.7.1.4).

-148 **Character data not allowed**

A legal character data element was encountered where prohibited by the device.

-150 **String data error**

This error, as well as errors -151 through -159, are generated when parsing a string data element. This particular error message should be used if the device cannot detect a more specific error.

-151 **Invalid string data**

A string data element was expected, but was invalid for some reason (see IEEE 488.2, 7.7.5.2); for example, an END message was received before the terminal quote character.

-158 **String data not allowed**

A string data element was encountered but was not allowed by the device at this point in parsing.

-160 **Block data error**

This error, as well as errors -161 through -169, are generated when parsing a block data element. This particular error message should be used if the device cannot detect a more specific error.

-161 **Invalid block data**

A block data element was expected, but was invalid for some reason (see IEEE 488.2, 7.7.6.2); for example, an END message was received before the length was satisfied.

-168 **Block data not allowed**

A legal block data element was encountered but was not allowed by the device at this point in parsing.

-170 **Expression error**

This error, as well as errors -171 through -179, are generated when parsing an expression data element. This particular error message should be used if the device cannot detect a more specific error.

-171 **Invalid expression**

The expression data element was invalid (see IEEE 488.2, 7.7.7.2); for example, unmatched parentheses or an illegal character.

-178 **Expression data not allowed**

A legal expression data was encountered but was not allowed by the device at this point in parsing.

-180 **Macro error**

This error, as well as errors -181 through -189, are generated when defining a macro or executing a macro. This particular error message should be used if the device cannot detect a more specific error.

-181 **Invalid outside macro definition**

Indicates that a macro parameter placeholder ($<number) was encountered outside of a macro definition.

-183 **Invalid inside macro definition**

Indicates that the program message unit sequence, sent with a *DDT or *DMC command, is syntactically invalid (see 10.7.6.3).

-184 **Macro parameter error**

Indicates that a command inside the macro definition had the wrong number or type of parameters.

Execution Errors [–299, –200]

An < error/event number > in the range [–299, –200] indicates that an error has been detected by the instrument's execution control block. The occurrence of any error in this class should cause the execution error bit (bit 4) in the event status register (*IEEE 488.2*, section 11.5.1) to be set. One of the following events has occurred:

- A < PROGRAM DATA > element following a header was evaluated by the device as outside of its legal input range or is otherwise inconsistent with the device's capabilities.
- A valid program message could not be properly executed due to some device condition.

Execution errors shall be reported by the device after rounding and expression evaluation operations have taken place. Rounding a numeric data element, for example, shall not be reported as an execution error. Events that generate execution errors shall not generate Command Errors, device-specific errors, or Query Errors.

–200 Execution error

This is the generic syntax error for devices that cannot detect more specific errors. This code indicates only that an Execution Error as defined in IEEE 488.2, 11.5.1.1.5 has occurred.

–201 Invalid while in local

Indicates that a command is not executable while the device is in local due to a hard local control (see IEEE 488.2, 5.6.1.5); for example, a device with a rotary switch receives a message which would change the switches state, but the device is in local so the message can not be executed.

–202 Settings lost due to rtl

Indicates that a setting associated with a hard local control (see IEEE 488.2, 5.6.1.5) was lost when the device changed to LOCS from REMS or to LWLS from RWLS.

-210 **Trigger error**

-211 **Trigger ignored**

Indicates that a GET, *TRG, or triggering signal was received and recognized by the device but was ignored because of device timing considerations; for example, the device was not ready to respond. Note: a DT0 device always ignores GET and treats *TRG as a Command Error.

-212 **Arm ignored**

Indicates that an arming signal was received and recognized by the device but was ignored.

-213 **Init ignored**

Indicates that a request for a measurement initiation was ignored as another measurement was already in progress.

-214 **Trigger deadlock**

Indicates that the trigger source for the initiation of a measurement is set to GET and subsequent measurement query is received. The measurement cannot be started until a GET is received, but the GET would cause an INTERRUPTED error.

-215 **Arm deadlock**

Indicates that the arm source for the initiation of a measurement is set to GET and subsequent measurement query is received. The measurement cannot be started until a GET is received, but the GET would cause an INTERRUPTED error.

-220 **Parameter error**

Indicates that a program data element related error occurred. This error message should be used when the device cannot detect the more specific errors described for errors -221 through -229.

-221 **Setting conflict**

Indicates that a legal program data element was parsed but could not be executed due to the current device state (see IEEE 488.2, 6.4.5.3 and 11.5.1.1.5.)

-222 **Data out of range**

Indicates that a legal program data element was parsed but could not be executed because the interpreted value was outside the legal range as defined by the device (see *IEEE 488.2*, 11.5.1.1.5.)

-223 **Too much data**

Indicates that a legal program data element of block, expression, or string type was received that contained more data than the device could handle due to memory or related device-specific requirements.

-224 **Illegal parameter value**

Used where exact value, from a list of possibles, was expected.

-230 **Data corrupt or stale**

Possibly invalid data; new reading started but not completed since last access.

-231 **Data questionable**

Indicates that measurement accuracy is suspect.

-240 **Hardware error**

Indicates that a legal program command or query could not be executed because of a hardware problem in the device. Definition of what constitutes a hardware problem is completely device-specific. This error message should be used when the device cannot detect the more specific errors described for errors –241 through –249.

–241 **Hardware missing**

Indicates that a legal program command or query could not be executed because of missing device hardware; for example, an option was not installed. Definition of what constitutes missing hardware is completely device-specific.

–250 **Mass storage error**

Indicates that a mass storage error occurred. This error message should be used when the device cannot detect the more specific errors described for errors –251 through –259.

–251 **Missing mass storage**

Indicates that a legal program command or query could not be executed because of missing mass storage; for example, an option that was not installed. Definition of what constitutes missing mass storage is device-specific.

–252 **Missing media**

Indicates that a legal program command or query could not be executed because of a missing media; for example, no disk. The definition of what constitutes missing media is device-specific.

–253 **Corrupt media**

Indicates that a legal program command or query could not be executed because of corrupt media; for example, bad disk or wrong format. The definition of what constitutes corrupt media is device-specific.

-254 **Media full**

Indicates that a legal program command or query could not be executed because the media was full; for example, there is no room on the disk. The definition of what constitutes a full media is device-specific.

-255 **Directory full**

Indicates that a legal program command or query could not be executed because the media directory was full. The definition of what constitutes a full media directory is device-specific.

-256 **File name not found**

Indicates that a legal program command or query could not be executed because the file name on the device media was not found; for example, an attempt was made to read or copy a nonexistent file. The definition of what constitutes a file not being found is device-specific.

-257 **File name error**

Indicates that a legal program command or query could not be executed because the file name on the device media was in error; for example, an attempt was made to copy to a duplicate file name. The definition of what constitutes a file name error is device-specific.

-258 **Media protected**

Indicates that a legal program command or query could not be executed because the media was protected; for example, the write-protect tab on a disk was present. The definition of what constitutes protected media is device-specific.

-260 **Expression error**

Indicates that an expression program data element related error occurred. This error message should be used when the device cannot detect the more specific errors described for errors -261 through -269.

-261 **Math error in expression**

Indicates that a syntactically legal expression program data element could not be executed due to a math error; for example, a divide-by-zero was attempted. The definition of math error is device-specific.

-270 **Macro error**

Indicates that a macro-related execution error occurred. This error massage should be used when the device cannot detect the more specific errors described for errors -271 through -279.

-271 **Macro syntax error**

Indicates that a syntactically legal macro program data sequence, according to IEEE 488.2, 10.7.2, could not be executed due to a syntax error within the macro definition (see *IEEE 488.2*, 10.7.6.3.)

-272 **Macro execution error**

Indicates that a syntactically legal macro program data sequence could not be executed due to some error in the macro definition (see IEEE 488.2, 10.7.6.3.)

-273 **Illegal macro label**

*Indicates that the macro label defined in the *DMC command was a legal string syntax but could not be accepted by the device (see* IEEE 488.2, 10.7.3 and 10.7.6.2); for example, the label was too long, the same as a common command header, or contained invalid header syntax.

-274 **Macro parameter error**

Indicates that the macro definition improperly used a macro parameter placeholder (see IEEE 488.2, 10.7.3).

-275 **Macro definition too long**

Indicates that a syntactically legal macro program data sequence could not be executed because the string or block contents were too long for the device to handle (see *IEEE 488.2*, 10.7.6.1).

-276 **Macro recursion error**

Indicates that a syntactically legal macro program data sequence could not be executed because the device found it to be recursive (see IEEE 488.2, 10.7.6.6).

-277 **Macro redefinition not allowed**

*Indicates that a syntactically legal macro label in the *DMC command could not be executed because the macro label was already defined (see* IEEE 488.2, 10.7.6.4).

-278 **Macro header not found**

Indicates that a syntactically legal macro label in the *GMC? query could not be executed because the header was not previously defined.

-280 **Program error**

Indicates that a downloaded program-related execution error occurred. This error message should be used when the device cannot detect the more specific errors described for errors -281 through -289.

NOTE A downloaded program is used to add algorithmic capability to a device. The syntax used in the program and the mechanism for downloading a program is device-specific.

-281 **Cannot create program**

Indicates that an attempt to create a program was unsuccessful. A reason for the failure might include not enough memory.

-282 **Illegal program name**

The name used to reference a program was invalid; for example, redefining an existing program, deleting a nonexistent program, or in general, referencing a nonexistent program.

-283 **Illegal variable name**

An attempt was made to reference a nonexistent variable in a program.

-284 **Program currently running**

Certain operations dealing with programs may be illegal while the program is running; for example, deleting a running program might not be possible.

-285 **Program syntax error**

Indicates that a syntax error appears in a downloaded program. The syntax used when parsing the downloaded program is device-specific.

-286 **Program runtime error**

Query Errors [–399, –300]

An < error/event number > in the range [–399, –300] indicates that the instrument has detected an error which is not a command error, a query error, or an execution error; some device operations did not properly complete, possibly due to an abnormal hardware or firmware condition. These codes are also used for self-test response errors. The occurrence of any error in this class should cause the device-specific error bit (bit 3) in the event status register (IEEE 488.2, section 11.5.1) to be set. The meaning of positive error codes is device-dependent and may be enumerated or bit mapped; the <error message> string for positive error codes is not defined by SCPI and available to the device engineer. Note that the string is not optional; if the designer does not wish to implement a string for a particular error, the null string should be sent (for example 42," "). The occurrence of any error in this class should cause the device-specific error bit (bit 3) in the event status register (IEEE 488.2, section 11.5.1) to be set. Events that generate device-specific errors shall not generate command errors, execution errors, or query errors; see the other error definitions in this section.

–300 **Device-specific error**

This is the generic device-dependent error for devices that cannot detect more specific errors. This code indicates only that a Device-Dependent Error as defined in *IEEE 488.2*, 11.5.1.1.6 has occurred.

–310 **System error**

Indicates that some error, termed "system error" by the device has occurred. This code is device dependent.

–311 **Memory error**

Indicates that an error was detected in the device's memory. The scope of this error is device-dependent.

-312 **PUD memory lost**

Indicates that the protected user data saved by the *PUD command has been lost.

-313 **Calibration memory lost**

Indicates that nonvolatile calibration data used by the *CAL? command has been lost.

-314 **Save/Recall memory lost**

Indicates that the nonvolatile data saved by the *SAV? command has been lost.

-315 **Configuration memory lost**

Indicates that the nonvolatile data saved by the device has been lost. The meaning of this error is device-specific.

-330 **Self-test failed**

-350 **Queue overflow**

A specific code entered into the queue in lieu of the code that caused the error. This code indicates that there is no room in the queue and an error occurred but was not recorded.

-360 **Communication error**

This is the generic communication error for devices that cannot detect the more specific errors described for errors -361 through -363.

-361 **Parity error in program message**

Parity bit not correct when data received for example, on a serial port (for example, a baud rate mismatch).

-362 **Framing error in program message**

A stop bit was not detected when data was received for example, on a serial port.

-363 **Input buffer overrun**

Software or hardware input buffer on serial port overflows with data caused by improper or nonexistent pacing.

Query Errors [-499, -400]

An < error/event number > in the range [-499, -400] indicates that the output queue control of the instrument has detected a problem with the message exchange protocol described in *IEEE 488.2*, chapter 6. The occurrence of any error in this class should cause the query error bit (bit 2) in the event status register (IEEE 488.2, section 11.5.1) to be set. These errors correspond to message exchange protocol errors described in *IEEE 488.2*, section 6.5. One of the following is true:

- An attempt is being made to read data from the output queue when no output is either present or pending;
- Data in the output queue has been lost.

Events that generate query errors shall not generate command errors, execution errors, or device-specific errors; see the other error definitions in this section.

-400 Query error

This is the general query error for devices that cannot detect more specific errors. This code indicates only that a Query Error as defined in IEEE 488.2, 11.5.1.1.7 and 6.3 has occurred.

-410 Query INTERRUPTED

Indicates that a condition causing an INTERRUPTED Query error occurred (see IEEE 488.2, 6.3.2.3); for example, a query followed by DAB or GET before a response was completely sent.

-420 Query UNTERMINATED

Indicates that a condition causing an UNTERMINATED Query error occurred (see IEEE 488.2, 6.3.2.2); for example, the device was addressed to talk and an incomplete program message was received.

-430 Query DEADLOCKED

Indicates that a condition causing a DEADLOCKED Query error occurred (see IEEE 488.2, 6.3.1.7); for example, both input buffer and output buffer are full and the device cannot continue.

-440 Query UNTERMINATED after indefinite response

Indicates that a query was received in the same program message after a query requesting an indefinite response was executed (see IEEE 488.2, 6.5.7.5.7.)

:

:FETCh,8-4
:INPut:TELecom,8-7
:OUTPut:TELecom,8-10
:SENSe:DATA,8-40
:SENSe:DATA:TELecom,8-40
:SENSe:DATA:TELecom:SDH,8-41
:SENSe:DATA:TELecom:SONet,8-43
:SOURce:CLOCk,8-16
:SOURce:DATA:TELecom,8-18
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In This Book

This book contains the information required for remote control of the OmniBER OTN.

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